Doctoral School of Interdisciplinary Medicine

Impact of paramedical counseling on infertile male patients' coping strategies and care satisfaction

Ph.D. Thesis

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List of Abbreviations

ART	Assisted Reproductive Technology
ASRM	American Society of Reproductive Medicine
BDI	Beck Depression Inventory
BMI	Body Mass Index
CRQ	Conflict Resolution Questionnaire
ICSI	Intracytoplasmic Sperm Injection
IICO	International Infertility Counseling Organization
IMSI	Intracytoplasmic Morphologically selected Sperm Injection
IUI	Intrauterine Insemination
IVF	In Vitro Fertilization
MESA	Microsurgical Epididymal Sperm Aspiration
MHPG	Mental Health Professional Group
mTESE	microsurgical Testicular Sperm Extraction
TESE	Testicular Sperm Extraction
TESA	Testicular Sperm Aspiration
PSS	Perceived Stress Scale
RSCI	Rahe Stress and Coping Inventory
RSES	Rosenberg Self-Esteem Scale
RLP	Reproductive Life Plan
SSC	Social Support Scale
STAI	State-Trait Anxiety Inventory
WCQ	Ways of Coping Questionnaire
WHO	World Health Organization

1. Introduction

Although several approaches, including biomedical and psychosocial, define infertility, most of them describe it as a female's inability to become pregnant from a medical perspective (Lakatos, et al., 2014). Even though minor changes have been made to it, the definition employed by the WHO has been accepted for more than a decade: 'Infertility is the disease of the reproductive system when pregnancy does not occur despite regular sexual intercourse without using contraception for 12 months'. Since reproduction is essential, both individual and social difficulties in this aspect place an immense psychological burden on the infertile couple (Chiaffarino, et al., 2011; Kahyaoglu & Balkanli, 2015). Almost 15%–20% of couples in developed countries face the problem of infertility (Policy Audit on Fertility, 2017). According to European data, the number of couples receiving infertility treatment is increasing. This tendency has also been observed in Hungary (Kaáli & Bártfai, 2018). In Hungary, approximately 24% of couples are unwillingly childless; in other words, one out of four couples has an infertility problem (Hungarian Central Statistical Office, 2014). Studies have shown that in 50% of infertile couples, only the male partner or both partners are affected (Jungwirth, et al., 2017). In addition to the known organic reasons, many lifestyle and environmental factors can be expected to contribute to this.

According to the 2017 male infertility guidelines of the European Association of Urology with the use of up-to-date diagnostics and treatments 3% of women remains childless and 6% is unable to give birth as many times as they want (Jungwirth, et al., 2017). The cumulative pregnancy ratio in a two years follow-up period is 27% among couples where the primary reason for infertility was oligozoospermia. The age of the woman is the main variable altering the outcome in assisted reproduction. Comparing the reproductive potential of 25-year-old women with 35-year-old women it shows a decrease to 50%, at the age of 38 the decrease is to 25%, above 40 years it is to 5%. It is widely known that in western countries women postpone their first pregnancy after finishing education and setting up a carrier (Jungwirth, et al., 2017).

The biopsychosocial theoretical model of infertility allows us to interpret the lack of fertility, not only from the medical point of view, but also as a psychosocial phenomenon.

Being able to reproduce is an important part of one's identity. Consequently, patients experience infertility as a major stressful life event. Being unwillingly childless increases the occurrence of anxiety and depression and concurrently, decreases quality of life (Cserepes, et al., 2014; El Kissi, et al., 2013; Hadley & Hanley, 2011). Males experience significant distress when they experience infertility.

Furthermore, anxiety, a decrease in self-esteem and stigmatization may be more prominent in male factor infertility than in idiopathic or female factor infertility (Furman, et al., 2010; Petok, 2015; Throsby & Gill, 2004).

Men's coping strategies, health information seeking habits, and knowledge of infertility are similar to women, but there are more different points in their responses given to the problem. Programs designed to change adverse health behaviors can be effective elements in the management of infertility (Nikoloudakis, et al. 2018).

To properly treat infertility and associated comorbidities and to prevent possible complications, patients need to learn new skills and increase their knowledge.

Although information is available to patients through many channels, especially the Internet, the reliability, and quality of this information are not always guaranteed. After consulting with a physician, it is common for men experiencing infertility to seek information about help in decision-making (Baunacke, et al., 2018).

Personalized patient education is significantly more effective if, in personal consultations, all patients have access to information appropriate for their prior knowledge, literacy, current needs, and psychosocial status (Roter & Hall, 2004).

The results of studies exploring the need for interventions and targeted programs suggest that comprehensive clinical care among infertility services is particularly important in protecting the emotional well-being of men experiencing infertility. Men are increasingly likely to trust someone and are eager for information and emotional support (Hammarberg, et al., 2010).

International Infertility Counseling Organization (IICO) operates in many countries worldwide, with the primary objective of improving the well-being of patients who are undergoing assisted reproductive technology (ART). The IICO conducts their activities in close cooperation with reproductive health centers to assist and perform psychological counseling, provide care, and ensure that psychosocial interventions are readily available. The International organizations play a significant role in the training of reproductive counselors, with the aim of preparing doctors, nurses, embryologists, social workers, and psychologists for the required purpose. Specialists in reproductive medicine have knowledge of medical, psychosocial, legal, and ethical perspectives, as well as in fertility and ART. The Mental Health Professional Group of the American Society for Reproductive Medicine has provided guidelines for determining the qualifications and training of reproductive medicine professionals.

Mental health professionals play an increasingly important role in reproductive medicine owing to technological advances and the detection of complex psychosocial problems in infertile

patients. As a result, there is an increasing need for the skills and services of qualified infertility counselors to support patients. In Hungary, with the deterioration of fertility indicators and an increase in the number of ART treatments, it has become increasingly necessary to train consultants specializing in reproductive care.

The use of counseling strategies will enable a person in need to obtain information, develop new skills, and develop new habits (Kitto, et al., 2015; Legare, et al., 2008). For this reason, professional psychological assistance has received more emphasis for the treatment of infertile couples (Boivin & Gamerio, 2015; Hakim, et al., 2012).

Research suggests that reproductive life plan-based counseling can increase fertility awareness in men. Of the men who receive counseling, 76% had a positive experience with counseling, and 77% obtained new information. The intervention helped to increase the different aspects of men's fertility awareness (Bodin, et al., 2018).

So, health workers, nurses and medicals dealing with infertile male patients should devote a special and high attention to the patient conducting and paramedical counseling as supportive therapy. In the frame of it – besides giving information – the individual support contributes to the elaboration of information, arising effects and experiences furthermore to the development of adaptive coping strategies for stress, and to the modification of direct or indirect changes in health behavior affecting reproductive health during the treatment period.

2. Background

2.1 Etiological Factors of Male Infertility

The branch of andrology has described several etiological factors of male infertility. Possible causes include morphological or positional alterations of the reproductive organs; varicocele; obstruction of the ejaculatory duct; inflammation; infections; endocrinological, genetic, immunological and biochemical reasons; systematic diseases; tumors and their treatments; and other external harmful factors, such as high temperatures and vibration (Schill, et al., 2006). After excluding these factors, an alteration in the parameters of the sperms (concentration, motility and morphology) often persists although its cause is not entirely clear yet. Consequently, the role of endocrine disruptors due to pollution and reactive oxygen species is assumed (Schill, et al., 2006).

According to the 2017 guidelines of the European Association of Urology on male infertility, infertility of an unknown origin (idiopathic) is given in 31% of all cases (Jungwirth, et al., 2017).

In previous decades during which the development and persistence of idiopathic infertility was examined, a significant role was attributed to the individual's or the couple's psychopathology, thus, mixing psychogenic and idiopathic infertility.

2.2 Lifestyle and Health Behavior

The health condition of males in our country is less discussed -probably due to the society's attitudes- than females. Among Hungarian men premature death between the ages 49-65 is common and it is underlain by the chronic stress factors of the changing society and high-risk behaviors to alleviate stress (Kopp & Skrabski, 2009). The latest WHO medical definition of infertility considers it as a disease hence couples are entitled to receive medical treatment (Gurunath, et al., 2011). Most patients however bear being a patient poorly, since they are mostly healthy men and women.

In the past decades, the role of lifestyle factors receives more emphasis as risk factors of reproductive health. The increase in scientific interest is probably because lifestyle factors are mostly under the person's own control and they can be changed more or less.

Obesity decreases reproductive capacity by causing a deterioration in sperm quality (decrease in concentration and motility). Higher than average weight is the leading risk factor of erectile dysfunction (Bacon, 2016). Among obese males the change in reproductive hormone profile (decreased androgens, increased estrogen) may deteriorate spermatogenesis (Du Plessis, et al., 2015; Kort, et al., 2016).

Sallmén, et al., (2016) studied the effect of weight on fertility. By examining 2011 couples they found that infertility occurs more frequently in the group with a higher body mass index (BMI). Compared to the group of males with a BMI of 20 to 22 kg/m^2 an increase of three points in the index increased the risk of infertility significantly (Sallmén, et al., 2016; Bacon, 2016). According to studies examining the effect of obesity weight loss causes a positive outcome in sperm analysis: sperm concentration and the amount of sperms with normal morphology significantly increases (Hakonsen, et al., 2011).

Naturally, weight is not independent of eating habits. Studies showed that compared to the group with decreased sperm quality the diet of those with normal sperm profile was richer in carbohydrates, fibers, they had adequate folate, lycopene and vitamin C levels and they ate less protein and fat. Low antioxidant intake probably impairs known sperm parameters (Li, et al., 2011). Several controlled and well-validated trials provide evidence that food supplementation with particular substances can improve the semen quality and function of subfertile men, the

fertilizing potential. Nutriceutical food supplementation should also be considered before IVF and ICSI, in order to reduce the oxidative damage to sperm DNA. Nutriceuticals are judiciously formulated food supplements containing particular vitamins (E and C), antioxidants, minerals and plant extracts (Bernard, et al., 2003).

Smoking is a risk factor of cardiovascular diseases, but among others it is also a risk factor of infertility. Smoking impairs sperm quality -concentration, motility, morphology- in both healthy and infertile men (Olayaki, et al., 2014). Testosterone levels decrease, the risk of erectile dysfunction increases and in many cases sperm parameters are impaired (Waylen, 2009). Alcohol intake should also be mentioned as a risk factor of male infertility.

Alcohol not only significantly decreases the amount of the ejaculate but also impairs quality (motility, morphology). In a study of 100 men morphological alteration (teratozoospermia) was observed in 63% of moderate and 72% of heavy drinkers and they found decreased sperm count in 54% and 64% respectively (Olayaki, et al., 2014).

Physical activity proved to be a protective factor of also infertility. In healthy males exercising at least for one hour 3 times a week improves sperm quality, especially the morphology (Wise, et al., 2011). Moderate physical activity improves fertility also indirectly.

Excessive activity did not prove to be so beneficial. Among males partaking in vitro fertilization (IVF) the sperm concentration of those who rode the bicycle at least 5 hours a week was lower than in the group who did not practice such activity (Wogatzky, et al., 2017).

2.3 Reactions to Male Infertility

If a couple's desire and attempts to have a child remain unsuccessful, the affected male may experience a paranormative event. This may lead to symptoms of depression and/or anxiety, a decrease of self-esteem and social withdrawal. The quality of the affected male's relationships, work capacity, vision and his experience of the meaning of life may be affected negatively. These negative psychological conditions may diminish the male's quality of life and result in harmful health behaviors including smoking and drinking excessive amounts of alcohol (Fisher & Hammarberg, 2012; Greil, et al., 2010).

Literature differentiates between crises caused by unsuccessful reproduction and other stressful life events. The former is referred to as infertility distress. Facing the diagnosis, medical treatments and other difficulties associated with a life without children may be the couple's most stressful life event. The degree of infertility distress may vary individually and in relation to the time elapsed since the diagnosis. During the first year of treatment, patients

tend to report high levels of stress, which is normalised during the second year and significantly increased from the third year (Martins, et al., 2014; Pook & Krause, 2005).

The most studied question in relation to male infertility is how stress and emotional tension affect the chances of reproduction. The primary questions when studying the relationship between stress and infertility are whether stress causes infertility, whether it contributes to its occurrence, whether the fact and knowledge of infertility causes stress and whether the infertility treatment acts as a stress factor. Increasing evidence has supported the notion that stress is an important risk factor in the development of infertility. Infertility increases distress, which by endocrinological pathways by increasing serum prolactin levels further decreases the chances of conception (Martins, et al., 2014; Greil, et al., 2010; Wright, et al., 1991).

An increase in the desire to have a child may cause negative mental, physical and social effects. Accepting examinations and infertility treatment may also place a significant burden on both the individual and couple. During the examinations and treatment for assisted fertility, their mental burden is likely to increase and 14% of couples separate (Martins, et al., 2014). Emphasis has been placed on professional psychological assistance during the treatment of infertile couples (Boivin & Gamerio, 2015; Hakim, et al., 2012).

2.4 Coping Strategies

It is imperative to apply adaptive coping strategies in this markedly stressful situation in order to try to alleviate the negative effects of stress. How the individual or the couple copes adaptively with the problem of infertility and/or childlessness is dependent on various factors. These factors include the cause and nature of the infertility, the available individual's mental resources, the extent of available social support and the applied coping strategies. Knowledge about the psychology of coping leads to more possibilities to develop a person-centred and effective supporting programme. The method of help should be adjusted to the nature of the problem and the individual's needs and expectations (Chernoff, et al., 2020; Furman, et al., 2010; Peterson, et al., 2012; Petok, 2015; Van den Broeck, et al., 2010).

Infertility is a chronic state of stress, which causes difficulties in adaptation (Peterson, et al., 2006). Lazarus and Folkman's (1984) cognitive coping model proposes that successful coping in a stressful state depends on how the person assesses their own situation and whether they are able to choose appropriate coping strategies.

Two main strategies can be identified in Lazarus and Folkman's (1984) classic model: Problem-focused and emotion-focused coping.

Following this model, several studies confirmed that in infertility, emotion-focused coping tends to be adaptive because it is a low-control stressor for the person (Faramarzi, et al., 2013; Peterson, et al., 2006). Terry and Hynes (1998) divided emotion-focused coping into avoidance strategies such as wishful and dreamy thinking and emotional approach strategies including seeking support and sharing emotions. Terry and Hynes (1998) found that frequent use of coping strategies correlated positively with a lower level of stress and more favourable mental well-being. Studies on avoidance have demonstrated that avoiding situations and individuals reminiscent of infertility as well as self-accusation are insufficient coping strategies and are most unbeneficial for mental well-being. High levels of stress accompany both. Furthermore, they are predictive factors for the development of anxio-depressive symptoms (Faramarzi, et al., 2013; Peterson, et al., 2006).

Terry and Hynes (1998) emphasised that problem-solving may also be effective. Problem-focused coping may be divided into problem-management and problem-appraisal strategies. The latter refers to the cognitive re-evaluation of the stressful situation. Their empirical findings have demonstrated that problem-appraisal strategies significantly correlate with favourable psychological adaptation.

Various studies have shown that males usually struggle with limited possibilities to solve their problem of infertility or at least to help their partners. Subsequently, this inability leads to them feeling less effective and experiencing higher levels of stress. They feel incapable to solve the problem alone and they do not know what exactly to do to find a solution. Males commonly experience shame, guilt and feeling useless because they have no control over how and when to start a family (Greil, et al., 2010; Swierkowski-Blanchard, et al., 2016).

Different coping strategies can be effective at different stages of infertility treatment. An emotion-focused ruminant struggle after confronting an infertility diagnosis is adaptive, as it takes time to process the loss. This strategy is capable of reducing the emotional tension that is generated and provides the individual time to settle, after which the patient can effectively apply the problem-oriented coping strategy. For men, making a plan (i.e., a problem-centered approach) and distancing from the problem are considered to be the most effective (Farmarzi, et al., 2013; Peterson et al., 2006).

Planful problem-solving may be adaptive because modelling a strategy to solve the problem and planning the steps to reach the purpose increases feelings of control and competence and further helps the couple in their joint effort to solve the problem (Peterson, et al., 2006). The findings noted reveal that exchanging maladaptive coping strategies for adaptive strategies should be an important aim of infertility treatments.

3. The Place and Role of Patient Conducting in the Care of Andrological Patients

3.1 Infertility Counseling, Providing Help During Assisted Reproductive Treatment

Menning (1980) was the first to draw attention to the importance of providing psychosocial support during infertility treatment. The protocol in some countries like Switzerland is that couples have to attend a psychological consultation at least once (Boivin & Kentenich, 2002) while in other countries it remains a possibility. However, in other European countries such as Hungary, psychological support is only incidental or not available in infertility centers.

In a Danish study, 2, 250 persons were asked to relate their expectations of psychosocial services in several of the country's infertility centers. Most of the respondents expressed the need for adequate information of the medical treatment and for a person-centred approach (Schmidt, 2003).

Infertility counseling is a multidimensional task with three pillars: Support, providing information about the treatment and evaluation, which entails screening psychological vulnerability (Covington & Burns, 2006; Petok, 2015; Stammer, et al., 2002).

The main aim of assistance is emotional support. Several studies have revealed that infertility treatment may be likened to an emotional roller coaster (Verhaak, et al., 2010; Wischmann, 2013). Consequently, it is imperative to provide possibilities for emotional ventilation and adjusting appropriate support during the phases of treatment. Mobilizing coping strategies is also important. Accordingly, professionals should be provided the opportunity to learn different skills such as communication strategies. The patient and assistant should be the aim of the consultation so as to develop a better connection with the social environment and improve their relationship with the doctor. In many instances, counseling is the time to address the losses that the patients have experienced during unsuccessful treatments.

Counseling also functions as psychoeducation as it deals with the life event of being infertile and the psychological difficulties of the examinations. Special support may also be needed in decision situations and to understand findings. To involve a patient in decision-making enhances personal control and feelings of self-efficacy and thus, frustration during the treatment may be decreased. Furthermore, it is crucial that professionals providing help emphasize adaptive health behaviors (O'Donnell, 2007; Randi et al., 2016; Van den Broeck, et al., 2010).

During the evaluation, while screening psychological vulnerability, the professional providing help should monitor the patient's level of distress, emotional state, level of anxiety, depression and stress (Boivin, et al., 2011; Domar, 2015; Van den Broeck, et al., 2010; Verhaak, et al., 2010). Several infertility distress studies emphasize (Wischmann & Thorn, 2013) that a smaller subgroup can clearly be identified among those who suffer from infertility, these persons are significantly more vulnerable psychologically, especially they are more prone to depression and anxiety. This subgroup is the most endangered when assessing mental coping. When developing preventive psychological help, the identification of this subgroup should be paid special attention in order to yield appropriate psychological treatment to those who are more sensitive to stress (Emery, et al., 2003; Darwiche, et al., 2002).

Besides a general person-centred approach, more focused psychosocial support is also required during the entire period of treatment. Infertility counseling could be conducted by professional helpers such as mental hygienists and nurses who are familiar with psychology, infertility and assisted reproductive treatment. The infertility professional should use the parameters described previously for individuals or couples and should be available during the entire treatment (Covington & Burns, 2006; Domar, 2015; Furman, et al., 2010; Stevenson, et al., 2016).

Several lifestyle factors might underlie infertility issues. Body mass problems, smoking and drinking excessive amounts of alcohol decrease fertility (Du Plessis, et al., 2015; Kort, et al., 2016; Waylen, et al., 2009). Furthermore, an unhealthy diet, lack of physical activity and environmental harmful factors are associated with the unfavourable functioning of the reproductive organs. The outlined empirical findings suggest that infertility treatments can be augmented with lifestyle programmes that can enhance fertility effectively and in which patients can participate during medical treatment (Wise, et al., 2011).

Thus, it is important to develop complex programmes that respect the integrity of the body and the soul, that consider infertility problems to be a relationship issue and that suit the requirements of the patients perfectly (Brucker & McKenry, 2004; Domar, 2015; Randi, et al. 2016; Stevenson, et al., 2016; Szatmári, et al. 2018; Van den Broeck, et al., 2010).

3.2 Connection Between Patient Management and Paramedical Counseling

Paramedical counseling facilitates the integration of the content that clients want to convey into their own approach and experiences, thus enabling them to consciously reflect on and deal with their own situation and future opportunities.

Aims to adjust the client's problem solving and decision-making, thus guiding them. Without counseling guidance, it is often difficult for individuals to obtain a realistic grasp of their current situation as they are too close to the problem; thus, they can miss assisting and inhabiting factors as well as available opportunities. Applying proper counseling strategies to clients and their relatives helps them judge their current situation clearly. Paramedical counseling uses different facilitative and supportive strategies to yield the required flow of information (Hackney & Cormier, 1988).

3.3 Structure of the General Model of Patient Conducting

"An important element of patient conducting, and diagnosis is the understanding and decoding the messages and complaints of adult and mentally not disturbed patients, which call for the identification of subjective responses. The patients' basic attitudes toward their sickness and/or nursing situation, emotional statuses and coping strategies can be decoded through their messages, and some special types and characteristics of these can be defined" (Helembai, 2019a, pp.142).

With the help of specific programs mutually designed with the participation of patients, patients can participate actively, consciously and with proper preparation in their own healing process. The program package includes problems, selected by interview, physical assessment and monitoring a patient's status, which all have a definite impact on developing a program plan most suitable for the patient. With the goal of allowing patients to regain the highest level of autonomy in an actual health condition, programs based on nursing diagnoses provide information that patients can use to learn different ways of self-care and new skills.

Pedagogical experiences support that if the client is involved in designing the program and the new knowledge and skills are acquired through paramedical counseling, his/her involvement and activity in the healing process is enhanced (Linnenbrink, 2005; Stewart, 2020).

People who are provided information and skills feel important, accepted and acknowledged as valuable (Traux & Carkhuff, 1967). They become very well prepared and have the opportunity and inclination to ask questions relevant to their present and anticipated situations. Summarizing the effectiveness of the care program together with a patient is a promising method for ensuring the best patient outcomes.
In addition, to maintain one's human dignity, one must be able to participate in the decision-making, planning, and action (Helembai, 2019b).

Using the patient conducting process and its relevant program points step by step can help people with decreasing the level of their anxiety, elaborating their concerns and preventing frustrating situations (Helembai, 2019a).

In addition, nurses give advice and information to individuals or groups as part of their therapeutic role *via* discussions that help patients in their orientation, decision-making, and focus while utilizing the patient's own potentials and strength (Helembai, 2019a; Szatmári, et al., 2020).

Nurses can provide assistance in elaborating and managing physical and subjective responses to health problems and thus preventing complications. In a developed healthcare program, the relationship between qualified nursing professionals and patients or groups of patients is based on mutual regard and trust; they work together closely, providing individualized assistance: instead of "for," the nurses work together "with" the patients. (George, 1980; Kozier, et al., 2012).

4. Aims of the Study

This study aimed to assess the efficacy of the method of paramedical counseling provided by nursing during the treatment period for male factor infertility by employing the Patient Conducting Model developed during the last decade. Furthermore, the impact of the counseling on the development of infertile males' adaptive health behaviors that influence reproduction by broadening the knowledge of the patients during the treatment process and promoting positive change based on satisfaction rates was assessed.

The hypothesis of this study is that patient conducting supported by the method of paramedical counseling contributes to both patient satisfaction and participation in the entire program, from beginning to end, as assessed by a questionnaire.

We hypothesised that paramedical counseling as a method of the patient conducting process due to supporting the coping strategies of the observed group will become more problem-focused and there will be an improvement in the indicators of well-being

5. Material and Methods

5.1 Study Design

We collected information about the psychosocial characteristics of Hungarian males suffering from infertility or decreased reproductive capacity by employing general psychological questionnaires between 2017 and 2018. The test battery was completed in three locations by conducting face-to-face interviews: An infertility centre, an andrology clinic and an andrology out-patient unit. Criteria to participate in the study included male factor infertility and participation in infertility treatment in the same clinic.

5.2 Study Population

The participants included 108 individuals who were suffering from infertility or decreased reproductive capacity. Their ages ranged between 26 and 49 (average = 35.18, standard deviation = 4.92) years. The involved patients were from the Department of Obstetrics and Gynecology, the Department of Urology and the Infertility Center of Kaáli Institute at the Faculty of Medicine at the University of Szeged.

Ethics approval was obtained from the medical directors of the infertility and andrology clinics. All the participants volunteered, they received written information about the study and they signed a declaration of consent prior to completing the questionnaires (Human

Investigation Review Board University of Szeged, Albert Szent-Györgyi Clinical Centre, University of Szeged (82/2017-SZTE). This study was conducted in accordance with the 2008 revision of the 1975 Declaration of Helsinki.

This study focused exclusively on male factor infertility or decreased fertilization capacity. The patients were divided into two groups: the observed group, which included persons who received support therapy (n = 57), and the control group, which included those who did not receive support therapy (n = 51). The inclusion criterion for both groups was male factor infertility or decreased reproductive capacity. During the evaluation, we assessed vulnerability in both groups. The results of psychological questionnaires, the level of depression, anxiety and perceived stress, indirectly refer to vulnerability.

According to clinical diagnoses, there were three subgroups: (1) azoospermia (n = 24); (2) OAT syndrome (oligoasthenoteratozoospermia) (n = 51), oligoasthenozoospermia (n = 4) and oligozoospermia (n = 19); and (3) unexplained infertility (of unknown origin) (n = 10).

5.3 Questionnaires

The questionnaires were employed to assess the distress accompanying infertility as well as the coping and communication strategies the patients suffering from infertility used. In accordance with the literature, we used general test batteries to assess distress, which measured the occurrence of depressive symptoms and level of anxiety. These questionnaires had all been widely employed in studies examining groups of patients suffering from other diseases, healthy populations and infertile patients. The short version of the Beck Depression Inventory (Beck, 1972; Rozsa, et al., 2001) was used to measure depression and Perczel's version of The State-Trait Anxiety Inventory (STAI) (Perczel, et al., 2005) originally developed by Spielberger (1970) was employed to measure trait anxiety. Other measures employed included the Rosenberg Self-Esteem Scale (RESES) (Sallay, et al., 2014) to measure self-esteem; Caldwell's Social Support Questionnaire (Caldwell, et al., 1987) to assess social support; the Perceived Stress Scale (PSS) (Stauder & Konkoly, 2006) to measure perceived stress; the satisfaction with life subscale of the Rahe Stress and Coping Inventory (Rozsa, et al., 2005) to identify coping strategies and the Conflict Resolution Questionnaire, Ways of Coping Questionnaire (WCQ) (Rozsa, et al., 2008; Lazarus & Folkman, 1984). The participants also answered short questions on health behaviors including smoking, alcohol intake, healthy diet, physical activity and environmental harmful factors.

5.4 Fields of Interventions

Questionnaires to assess psychological vulnerability were completed in the first phase of treatment after being diagnosed with (1) or with a previously known and treated infertility (2), but prior to any operation, insemination or ART.

In the observed group, the validated questionnaires were completed at the start of medical interventions, in the first phase of counseling and after counseling at the end of the four months period. The control group only completed the validated questionnaires at the beginning and end of the medical treatment, they did not receive infertility counseling. After a thorough examination of the patients and after their reactions to, and awareness of the disease were assessed, the observed group during a four-month period received counseling and support altogether five times at three weeks intervals. Patient suffering from infertility or decreased fertility were involved in both groups (observed and control). They were provided counseling after randomization.

60 patients entered the observed group, 3 dropped-out after the start of the program, because they also ceased reproductive therapy due to poor prognosis (due to age) or financial reasons. 2 persons refused counseling due to lack of time.
58 patients entered the control group, 7 dropped-out because of the pre-term cessation of reproductive therapy due to personal reasons like unpredictable treatment planning, long waiting list and poor prognosis (several unsuccessful previous treatments).

The final sample consisted of altogether 108 male patients receiving assisted reproductive treatment, randomized to observed group (n = 57) and control group (n = 51).

Infertility counseling there is three pillars: (1) emotional support, (2) providing information about the treatment (3) and evaluation which entails screening psychological vulnerability.

On the first occasion, an interview to evaluate their emotional condition, anxiety, self-esteem, stress, depression, satisfaction with life, social support and coping strategies was conducted. The patients' expectations of the treatment were also assessed.

During the following intervention, the second pillar of the counseling, information about the treatment was provided; specifically, about the results of examinations and treatment alternatives. We encouraged the expression of emotions in relation to a potential operation, the identification of personal causes of distress, the mobilizing and development of coping strategies and skills and the exploration of the personal meaning of the infertility problem. In addition, emotional support was provided. After the psychoeducational compound of the consultation, we discussed healthy behaviors, lifestyle and stress issues.

Counseling also functions as psychoeducation as it deals with the life event of being infertile and the psychological difficulties of the examinations. Special support may also be needed in decision situations and to understand findings.

We adjusted the timing of the consultation to the exact state of the patients. In many instances, intervention is the time to address the losses that the patients have experienced during unsuccessful treatments. During the first phase, we provided them with the opportunity to ventilate freely about their infertility problem. Accordingly, professionals should be provided the opportunity to learn different skills such as communication strategies *(Table 1).*

Table 1: The Components of Infertility Counseling

Exploration	Assessment of anxiety, self-esteem, depression, satisfaction with life, stress reactivity, social support and the applied coping strategies
Support	Emotional support, providing space for ventilation. Exploration of the personal understanding of the infertility problem. Mobilization of coping strategies; facilitation of coping with distress. Increasing self-competence and activity (involving the client in decision making); Elaborating guilt and shame. Emphasizing the positive aspects of the difficult life situation, Assessment and support of the cohesion between the couple and the family.
Counseling	Psychoeducation; discussion of health behavior, life-style and stress. Providing information on the course of examinations, possible surgical interventions and therapeutic alternatives. Answering questions. Interpreting results. Providing help in decision making.

The psychoeducational part increased and deepened the patients' knowledge about decision-making. The importance of the positive aspects of extreme hardship was emphasised. Furthermore, monitoring and reflecting resources such as the cohesion of relationships and family support and increasing the patients' activities and competence were stressed.

The applied method relies on cognitive behavioral therapy combining it with facilitative and supportive techniques, which support the mobilization and concentration of inner resources, the acceptance of new knowledge and the development of new skills and habits. They also promote the elaboration of emotions and decision-making.

Facilitative techniques are e. g. paraphrasing, reflecting, summing up and clarifying emotions, confronting, questioning, providing information. Supportive techniques are e. g. the method of stopping thoughts, strategies supporting interpersonal efficacy, practicing assertiveness. Other techniques are strategies to change behavior, gradual recognition and alteration of emotions and behavior, habituation of situations.

Specific programs have been developed that enable an individual, with proper preparation, to actively participate and consciously take part in his/her own healing process *(Table 2).*

The interventions were standardized based on pre-set programs *(Table 3).* Main topics for program packages *(Table 4).*

Consultations were conducted following the pre-set topics, see in Tables 1 and 3. The above described program can be inserted into the applied medical treatment protocols.

To support decision-making based on a new level of awareness, the nurse works to enhance patient motivation and knowledge.

Table 2: Fields of Infertility Counseling

WHAT	**WHICH WAY**	
Creating program packages to get to the desired destination	**Performing** process by using paramedical counseling	**Evaluating** mutually the process by using paramedical counseling
Exploration of personal understanding of the infertility problem Information on the course of the examinations, possible surgical interventions, and therapeutic alternatives Healthy behavior, lifestyle, and stress; cohesion between the couple and family	*Facilitative techniques*, e.g., orientation, consultation, paraphrasing, reflecting, summing up, and clarifying emotions, confronting, questioning, providing information *Supportive techniques*, e.g., the method of stopping thoughts, strategies supporting interpersonal efficacy, practicing assertiveness; other techniques are strategies to change the behavior, gradual recognition, and alteration of emotions and behavior, habituation of situations	Mobilization of internal potential: knowledge, energy, and coping strategies for: • Elaborating guilt and shame • Realizing positive aspects of the difficult life situation • Increasing self-competence and activity involving the client in decision-making and for avoiding any further unwished-for (somatic and subjective) health consequences

Table 3: Standardized Programs of Providing Information and Psychoeducation

Session 1	*Program (1)*; Describing the course of required examinations for infertility. The knowledge regarding examinations: what, when and how. *Program (2);* Assessment and review of the importance and the results of examinations. *Program (3)*; Describing the diagnosed disease (decreased fertility/infertility) and assessment of the client's knowledge of the disorder. *Program (4);* Clarification and emphasizing the role of the partner.
Session 2	*Program (5);* Assessment of the key risk factors; (smoking, alcohol intake, stress, environmental risk factors) *Program (5.1);* Reviewing the significance of lifestyle. Pathologically elevated chronic stress, smoking, alcohol intake, environmental risk factors. Life-style counseling.
Session 3	*Program (6);* Evaluation, interpretation and review of the results of examinations. *Program (7);* Assessment of knowledge of and compliance with medicines. *Program (7.1);* Discussion of the significance and mechanisms of action of medicines and therapy settings (hormonal therapy, antioxidant treatment). *Program (7.2);* Describing the appropriate way of taking medicines. Program (8); Providing information to improve health (diet, antioxidants, lifestyle, physiology). Answering questions.
Session 4	*Program (9);* Describing surgical interventions to increase fertility/treat infertility. Answering questions (varicocele treatment, mTESE, TESA, MESA) *Program (9.1);* Providing further information on assisted reproductive treatment (e. g. IVF, IUI, ICSI, IMSI).
Session 5	Program (10); Summary. Program (10.1); How the knowledge of the patient changed. Discussion of the use of counseling in the patient's experience at the end of the programs. Program (10.2); The summary of the therapist at the end of the program.

Table 4: Main Topics for Program Packages

Paramedical Counseling Sessions				
First Meeting	Second Meeting	Third Meeting	Fourth Meeting	Fifth meeting
Creating a frame for programs with the aim of overcoming infertility problem	Information on the course of preparation for examinations, possible surgical interventions, and therapeutic alternatives	Interpreting and elaborating on the results of examination and intervention	Possibilities to prevent unwished-for consequences and to provide health status to get the desired aims	Final evaluation of the whole process with the participation of the patient and nurse therapist
The process of evaluation and selection aims subsequently (may alter them if needed, meeting to meeting) to improve the effectiveness of the treatment process				
Meetings are based on collaboration among patient–nurse–physician, which may be influenced by events deriving from the treatment process and the patient's goals				

The consultation were adapted to the mental state of each patient. This meant that we emphasized the 'topic' in which the actual patient showed the key problem, e. g. among those patients who showed more severe symptoms of anxiety, or elevated levels of stress, or decreased social support we emphasized these fields during counseling in order to facilitate them to use more adaptive coping mechanisms required in their specific situation.

5.5 Statistics

Data processing and evaluation were conducted by employing SPSS version 23. We performed descriptive statistics, a chi-squared test, Fisher's exact test, two sample t-test, Welch's t-test, repeated measures multivariate analysis of covariance and Spearman's rank correlation to evaluate the demographic characteristics and data of the clinical scales.

In the repeated measures multivariate analysis of covariance, the observed group was the interpersonal independent grouping variable, the two times of the measurement were personal grouping variables and time elapsed from the diagnosis and with family planning were covariates. Thus, the differences and bias in these variables between the two groups were controlled. The scales of the WCQ and the results of the STAI, BDI, RSES and Holmes-Rahe tests were the dependent variables. Statistical significance was defined as $p<0.05$. In accordance with the consensus, 95% confidence intervals are shown in the figures.

Descriptive statistics were expressed as mean and standard deviation for continuous variables and frequencies and relative frequencies for discrete variables. Statistical analysis was conducted using IBM SPSS Statistics v25 (R statistical version 3.6.2.). $P < 0.05$ was considered significant.

The differences in the demographic data between the therapy and control groups were compared using a paired-sample *t*-test and chi-squared test. The effects of the therapy were examined by the Wilcoxon rank test.

6. Results

Relevant demographic data of the control (n = 51) and observed (n = 57) groups that were related to the study hypothesis were compared; frequencies and averages are presented in *(Table 5).* There was no difference in the demographic characteristics of the two groups despite the significant difference between the two groups in relation to the time elapsed from the diagnosis of infertility; the observed group was diagnosed earlier (t = 3,1; DF = 82,457; p = 0,003). There was also a significant difference in the period of family planning. On average, the participants in the observed group had been trying to start a family for an extended period of time (*t* = 2.48; DF = 90.89; *p* = 0.02).

Table 5: Demographic characteristics (n = 108)

	Group				**Total**	
	Observed group		**Control group**			
	n	**%**	**n**	**%**	**n**	**%**
Education						
Vocational school	10	17.54%	6	11.76%	16	14.81%
High school	18	31.58%	19	37.25%	37	34.26%
College or university degree	29	50.88%	26	50.98%	55	50.93%
Marital state						
Married and living together	37	64.91%	36	70.59%	73	67.59%
Married and living separately	4	7.02%	4	7.84%	8	7.41%
Civil partnership	15	26.32%	11	21.57%	26	24.07%
Living alone	1	1.75%	0	0%	1	0.93%

Table 5: Demographic characteristics (n=108)

	Group				Total	
	Observed group		Control group			
	n	%	n	%	n	%
Activity						
Active financially. public servant	17	29.82%	17	33.33%	34	31.48%
Active financially. employed	28	49.12%	24	47.06%	52	48.15%
Active financially. entrepreneur	11	19.3%	9	17.65%	20	18.52%
Active financially. works temporarily	1	1.75%	1	1.96%	2	1.85%
Type of work						
manual labor	13	22.81%	10	19.61%	23	21.30%
white-collar job	15	26.32%	13	25.49%	28	25.93%
manual and intellectual work	17	29.82%	15	29.41%	32	29.63%
sitting job	12	21.05%	12	23.52%	24	22.22%
Type of residence						
capital city	0	0%	1	1.96%	1	0.93%
city	22	38.6%	29	56.86%	51	47.22%
shire-town	20	35.09%	10	19.61%	30	27.78%
village	15	26.32%	10	19.61%	25	23.15%
ranch	0	0%	1	1.96%	1	0.93%

Table 5: Demographic characteristics (n=108)

	Group				Total	
	Observed group		Control group			
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Diagnosis						
Azoospermia	38	66.7%	37	72.5%	75	69.44%
Oligozoospermia	13	22.8%	10	19.6%	23	21.30%
Idiopathic	6	10.5%	4	7.8%	10	9.26%
Age (years)	35.47	±5.56	34.84	±4.1	35.18	±4.92
Marital state (months)	7.63	±4.19	7.14	±4.74	7.4	±4.45
Date of diagnosis of infertility (months)	26.14	±24.63	14.8	±11.83	20.78	±20.38
Family planning (months)	36.12	±25.31	26.39	±14.49	31.53	±21.38

More than half of the patients surveyed had obtained a higher education, nearly two-thirds were married, and three-quarters lived in cities. In terms of nutrition, nearly 50% were moderate healthy eating, with 30% paying full attention to healthy eating. Nearly 80% of patients did not smoke, and they had similar rates of alcohol consumption.

In the observed group, 77% played sports on a weekly basis, compared with only 35% in the control group (χ^2 = 22.36; DF = 2; $p < 0.001$). There was no significant difference in the frequency of playing sport between the two groups (χ^2 = 4.335; DF = 2; $p < 0.114$); *(Table 6).*

Table 6: Characteristics of the Study Groups

	Observed Group (n=57)	**Control Group (n = 51)**	**Total (n = 108)**	**Test Value**	***P* Value**
Age				t = 0.675	0.501
Mean (SD)	35.474 (5.565)	34.843 (4.101)	35.176 (4.916)		
Education				χ^2 = 0.860	0.651
Vocational school	10 (17.5%)	6 (11.8%)	16 (14.8%)		
High school	18 (31.6%)	19 (37.3%)	37 (34.3%)		
College/university	29 (50.9%)	26 (51.0%)	55 (50.9%)		
	57 (100%)	51 (100%)	108 (100%)		
Marital status				χ^2 = 0.378	0.539
Married	37 (71.2%)	36 (76.6%)	73 (73.7%)		
Partnership	15 (28.8%)	11 (23.4%)	26 (26.3%)		
	53 (91.2%)	47 (92.2%)	100 (92.6%)		
Importance of healthy eating				χ^2 = 2.880	0.237
Little	15 (26.3%)	10 (19.6%)	25 (23.1%)		
Moderately	22 (38.6%)	28 (54.9%)	50 (46.3%)		
Quite	20 (35.1%)	13 (25.5%)	33 (30.6%)		
	57 (100%)	51 (100%)	108 (100%)		
Sport				χ^2 = 4.335	0.114
Less often than monthly	27 (47.4%)	25 (49.0%)	52 (48.1%)		
Once a week	23 (40.4%)	13 (25.5%)	36 (33.3%)		
Several times a week	7 (12.3%)	13 (25.5%)	20 (18.5%)		
	57 (100%)	51 (100%)	108 (100%)		
Smoking				χ^2 = 0.164	0.685
Nonsmoking	44 (77.2%)	41 (80.4%)	85 (78.7%)		
Smoking	13 (22.8%)	10 (19.6%)	23 (21.3%)		
	57 (100%)	51 (100%)	108 (100%)		
Alcohol				χ^2 = 0.365	0.546
Rarely	48 (84.2%)	45 (88.2%)	93 (86.1%)		

	Observed Group (n=57)	**Control Group (n = 51)**	**Total (n = 108)**	**Test Value**	***P* Value**
Often	9 (15.8%)	6 (11.8%)	15 (13.9%)		
	57 (100%)	51 (100%)	108 (100%)		
Family foundation				t = 2.483, df = 90.89	0.015 0.017
Mean (SD)	36.123 (25.307)	26.392 (14.489)	31.528 (21.380)		
Infertility				t = 3.096 df =82.457	0.003
Mean (SD)	26.132 (24.630)	14.804 (11.829)	20.782 (20.375)		
Diagnosis				χ^2 = 1.969	0.742
Idiopathic	6 (10.5%)	4 (7.8%)	10 (9.3%)		
Azoospermia	14 (24.6%)	10 (19.6%)	24 (22.2%)		
Oligozoospermia	10 (17.5%)	9 (17.6%)	19 (17.6%)		
Oligoastenozoospermia	3 (5.3%)	1 (2.0%)	4 (3.7%)		
Oligoasthenoteratozoospermia	24 (42.1%)	27 (52.9%)	51 (47.2%)		
Total	57 (100%)	51 (100%)	108 (100%)		

6.1 Analyses of the Coping Strategies

To test the hypothesis of the study, we first examined the clinical characteristics of the control and observed groups at the start so as to reduce bias due to potential differences *(Table 7).* According to statistics in WCQ's problem analysis (t = 0.47; DF = 106; p = 0.64), emotionally motivated action (t = 0.25; DF = 106; p = 0.81), purposeful action (t = 0.18; DF = 106; p =0.86), adaptation (t = -1.36; DF = 106; p = 0.18), asking for help (t = -0.64; DF = 106; p = 0.52), seeking emotional balance (t = -0.89; DF = 106; p = 0.38), scales in the STAI result (t = -0.05; DF =106; p = 0.96), in the BDI result (t = -0.07; DF = 106; 0.94), in the RSES result (t = 0.14; DF = 7106; p = 0,89) and in the results of Holmes-Rahe test (t = 0.06; DF = 106; p = 0.95), there was no difference at the start.

The withdrawal scale of the WCQ showed a difference at the start ($t = -2.26$; $DF = 106$; $p=0.03$).

According to the evaluation, the time elapsed during the examination ($F = 3.2$; $DF = 12\text{-}93$; $p = 0.001$) had a significant main effect. Furthermore, the interaction between the elapsed time and the intervention was also significant ($F = 7.53$; $DF = 12\text{-}93$; $p < 0.001$).

When comparing the data of the tests at the two occasions of measurement, a significant change in the BDI results ($F = 26.47$; $DF = 1\text{-}104$; $p = 0.002$, *Figure 1)*, in the STAI results ($F=8.82$; $DF = 1\text{-}104$; $p = 0.004$, *Figure 2)*, in the emotionally motivated action scale of WCQ ($F = 7.89$; $DF = 1\text{-}104$; $p = 0.006$, *Figure 3)* was evident; all three decreased. The interaction capturing the effect of the intervention was significant in the withdrawal ($F = 3.96$; $DF = 1\text{-}104$; $p = 0.049$, *Figure 4)*, purposeful action ($F = 58.75$; $DF = 1\text{-}104$; $p < 0.001$, *Figure 5)* and seeking emotional balance ($F = 4.68$; $DF = 1\text{-}104$; $p = 0.033$, *Figure 6)* scales of WCQ and in STAI results ($F = 4.33$; $DF = 1\text{-}104$; $p = 0.04$, *Figure 7) (Table 7).*

The withdrawal and purposeful action results of WCQ increased in the observed group while they decreased in the control group. Seeking emotional balance and trait anxiety of the STAI results decreased in the observed group and trait anxiety of the STAI results did not change with time in the control group.

Table 7: Psychodiagnostic tests Questionnaire's acknowledgements; ***WCQ;*** Ways of Coping Questionnaire***, STAI;*** State-Trait Anxiety Inventory, ***BDI;*** Beck Depression Inventory, ***RSES;*** Rosenberg Self-Esteem Scale, ***Holmes-Rahe;*** Rahe Stress and Coping Inventory

Questionnaires	**Observed group**		**Control group**		**All**	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
WCQ Problem analysis at start	1.92	±0.62	1.98	±0.76	1.95	±0.69
WCQ Problem analysis at end	2.02	±0.56	1.97	±0.68	1.99	±0.62
WCQ Emotionally motivated action at start	0.6	±0.48	0.62	±0.43	0.61	±0.45
WCQ Emotionally motivated action at end	0.52	±0.4	0.51	±0.36	0.52	±0.38
WCQ Purposeful action at start	1.3	±0.58	1.28	±0.5	1.29	±0.54
WCQ Purposeful action at end	1.63	±0.61	1.02	±0.42	1.34	±0.61
WCQ Adaptation at start	1.27	±0.68	1.45	±0.64	1.35	±0.67
WCQ Adaptation at end	1.22	±0.64	1.43	±0.64	1.32	±0.65
WCQ Asking for help at start	1.18	±0.76	1.26	±0.67	1.22	±0.72
WCQ Asking for help at end	1.32	±0.66	1.39	±0.73	1.36	±0.69
WCQ Emotional balance at start	1.29	±1.59	1.08	±0.61	1.19	±1.23
WCQ Emotional balance at end	1.18	±0.8	1.45	±0.72	1.31	±0.77
WCQ Withdrawal at start	1.32	±0.83	1.7	±0.9	1.5	±0.88
WCQ Withdrawal at end	1.41	±0.84	1.69	±0.9	1.54	±0.88
STAI at start	47.95	±3.78	47.98	±3.54	47.96	±3.65
STAI at end	47.19	±3.41	47.84	±3.25	47.5	±3.33
BDI at start	3.47	±4.17	3.53	±3.72	3.5	±3.94
BDI at end	2.28	±3.18	2.9	±3.12	2.57	±3.15
RSES at start	3.39	±0.49	3.38	±0.4	3.39	±0.45
RSES at end	3.47	±0.45	3.41	±0.39	3.44	±0.43
Holmes-Rahe at start	11.25	±2.49	11.22	±2.68	11.23	±2.57
Holmes-Rahe at end	11.3	±2.82	10.67	±3.1	11	±2.95

Figure 1: Beck Depression Inventory (BDI) results

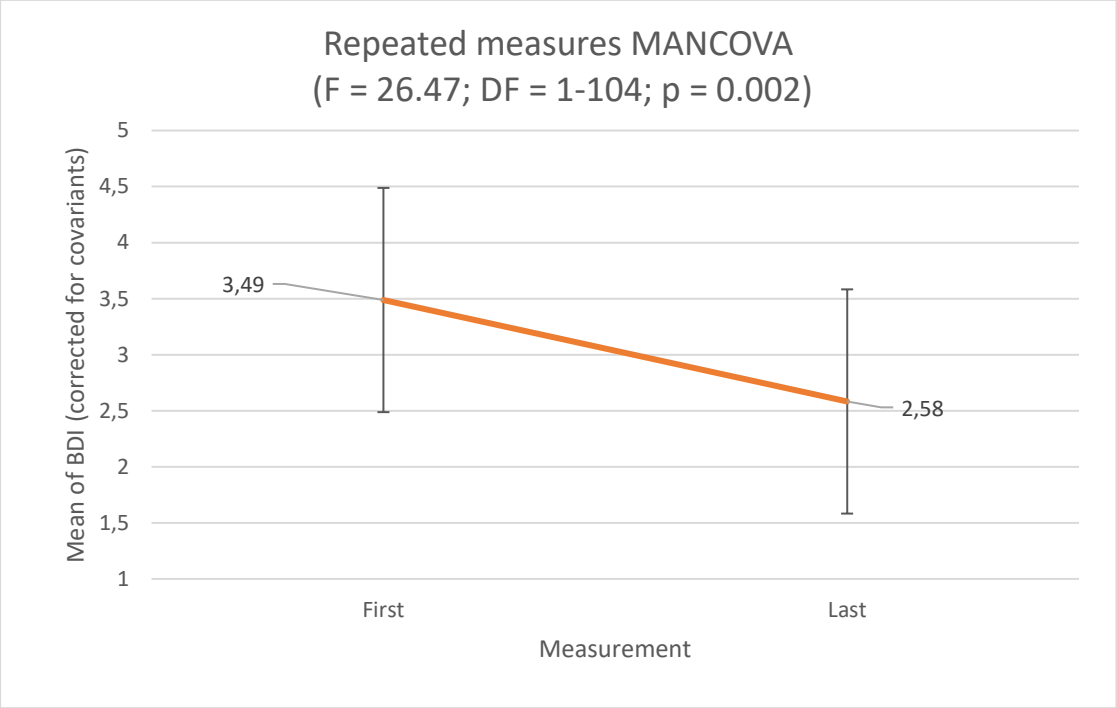


Figure 2: State-Trait Anxiety Inventory (STAI) results

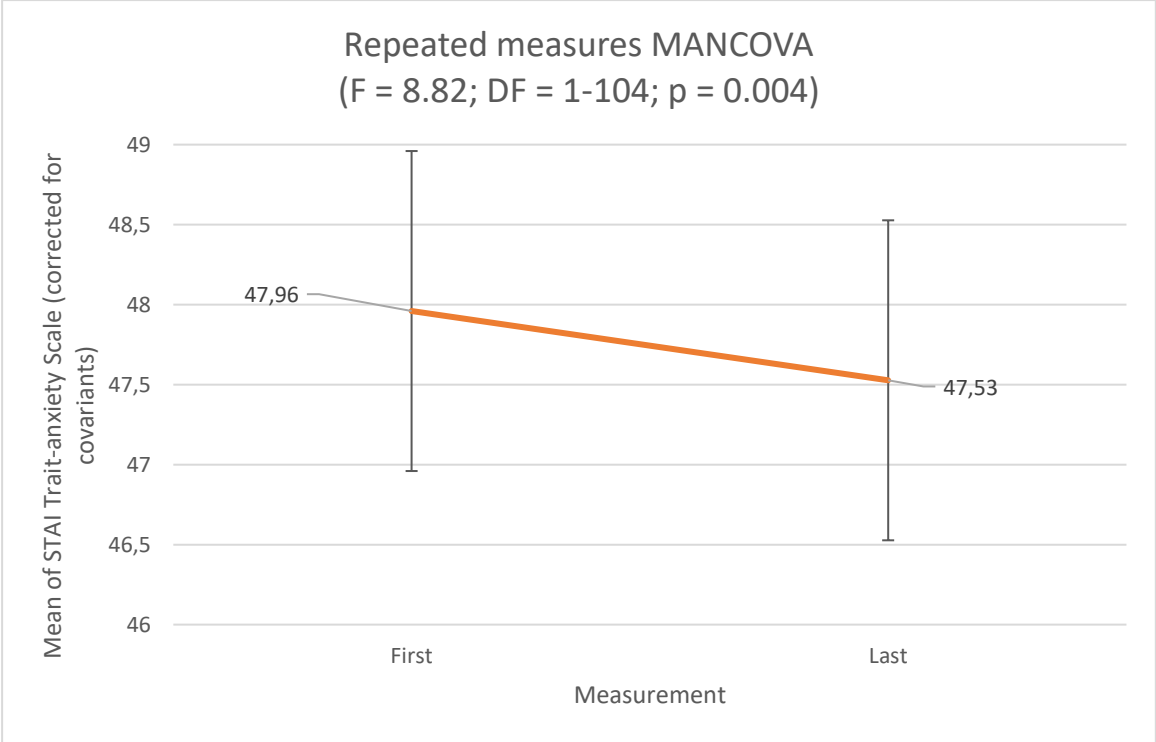


Figure 3: The emotionally motivated action scale of Ways of Coping Questionnaire (WCQ)

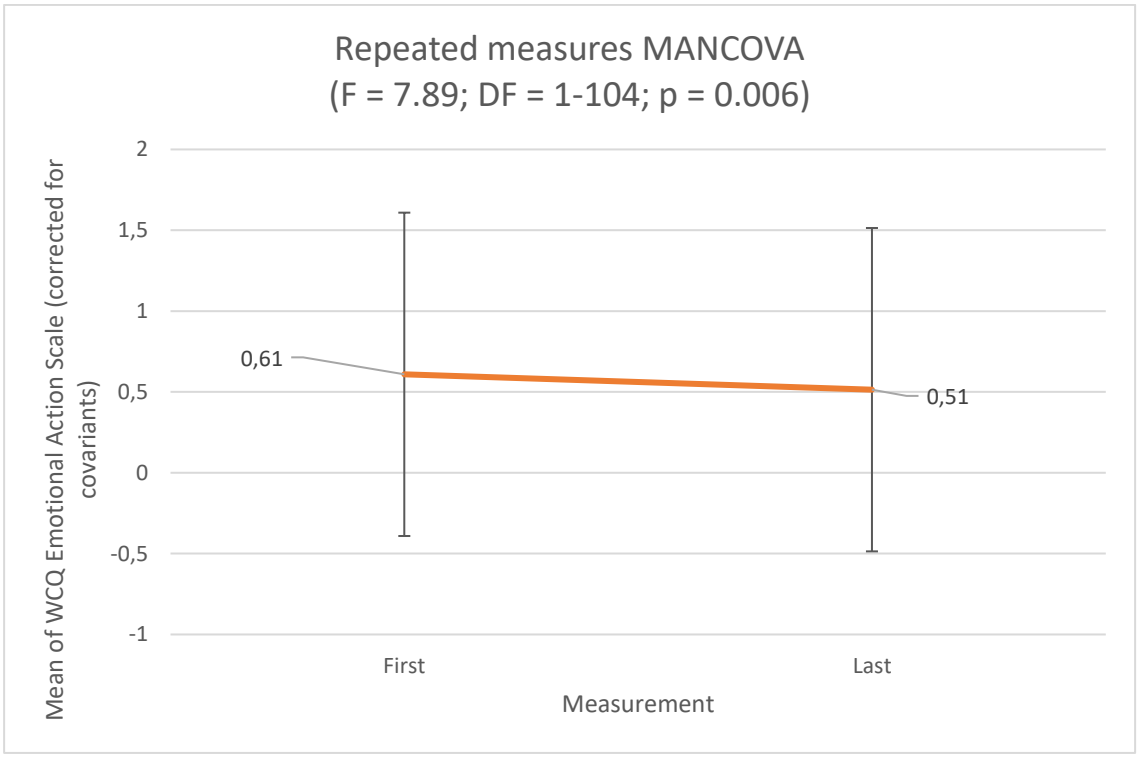


Figure 4: The withdrawal scale of Ways of Coping Questionnaire (WCQ)

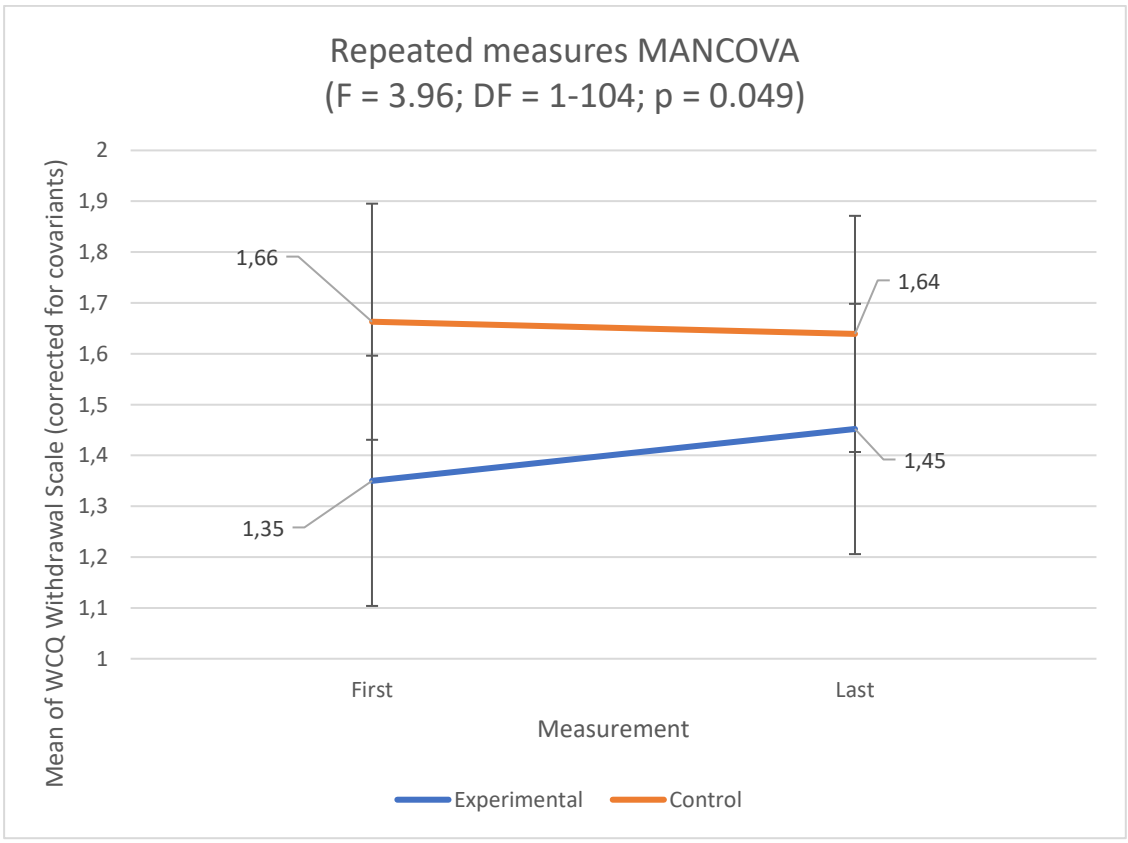


Figure 5: The purposeful action scale of Ways of Coping Questionnaire (WCQ)

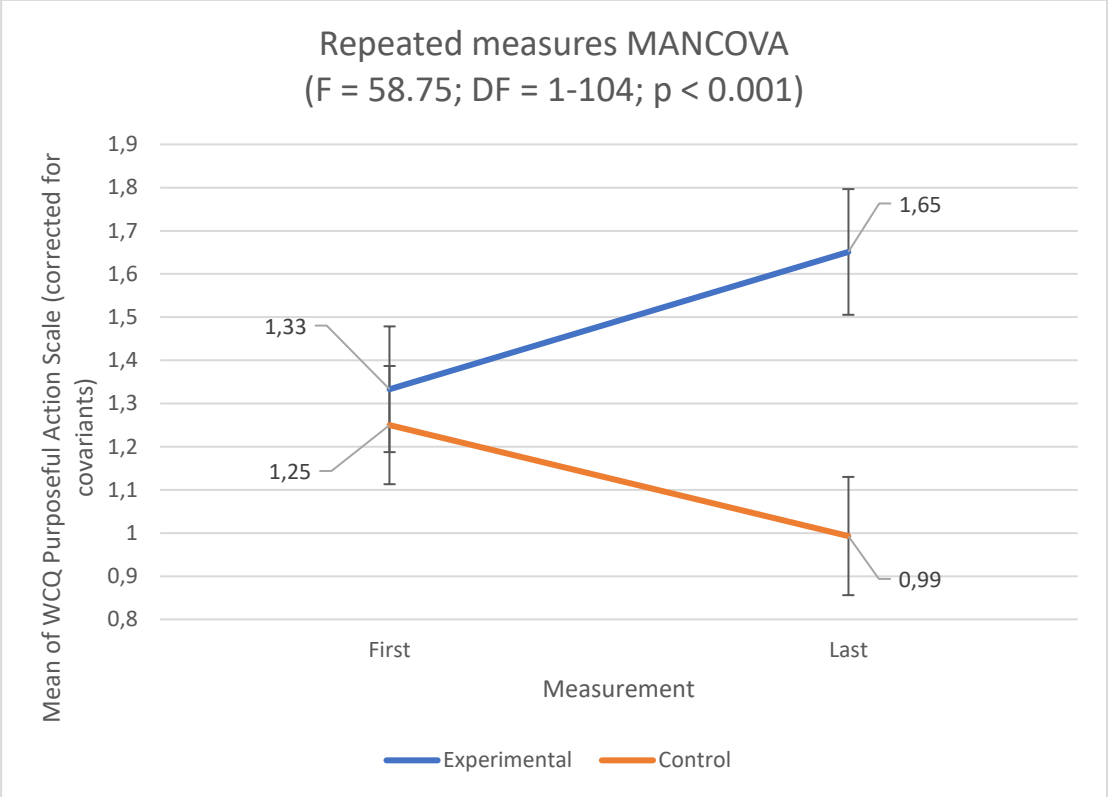


Figure 6: The seeking emotional balance scale of Ways of Coping Questionnaire (WCQ)

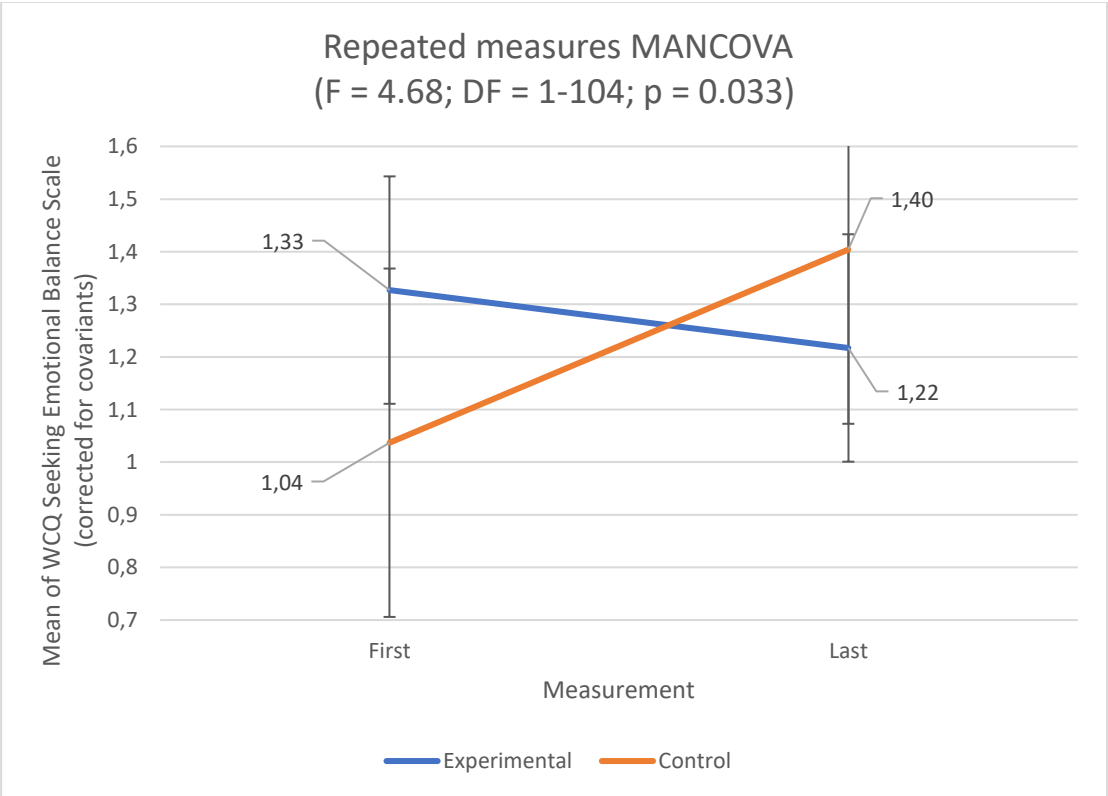
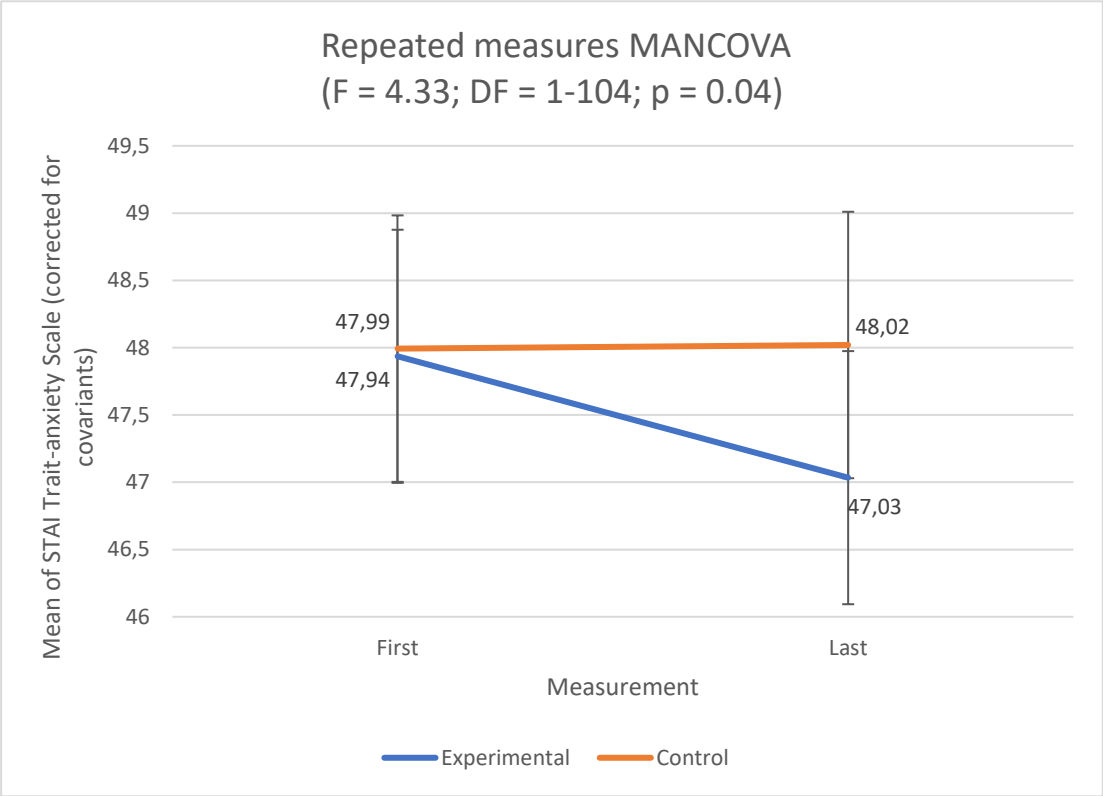


Figure 7: State-Trait Anxiety Inventory (STAI)



6.2 Patient Satisfaction

We found a significant change in the observed group with respect to their attitude toward the disease as a result of therapy (z = 3.260, p = 0.000, v =157; p = 0.001). Of the 39 potentially adequate patients, 11 had become adequate, and five of the seven patients with an aversive attitude had become potentially adequate *(Table 8).*

With regard to emotional state, 18 of the 44 patients who previously struggled with inertia, low self-esteem, and anxiety became energy mobilizing (z = −3.452, p = 0.001, v: 327.5; p < 0.001) *(Table 9).*

Eight of the 41 patients who used emotion-focused coping strategies switched to problem-focused coping strategies. Of the 28 patients who used avoiding strategies, two switched to problem-focused strategies, and 13 switched to emotion-focused strategies while asking for help strategies (z = −3.658, p = 0.000 v:236; p < 0.001). The time elapsed since the diagnosis of infertility was significantly longer in patients who used problem-focused coping strategies than in those who used emotion-focused strategies (t = 2.479, p = 0.024, p = 0.001) *(Table 10).*

In terms of patient satisfaction, 97% of the respondents in the observed group reported that supporting therapy was important. A total of 86% of patients indicated that supportive therapy contributed significantly to the expansion of their knowledge of the root cause of their infertility *(Table 11)*. A total of 89.4% of patients felt that they had knowledge of the course of the investigation, 82.4% of patients had knowledge of the therapeutic options, and 73.7% of patients had knowledge of health promotion *(Figures 8-10).*

Table 8: Impact of Patient Conducting on Patient Behavior

Attitudes to the disease before		**Attitudes Toward the Disease After Therapy**				**Total**
		Adequate	**Potentially adequate**	**Aversive–denying**	**Aversive–trivializing**	
Attitudes to the disease before	**Adequate**	9	2	0	0	11
		81.8%	18.2%	0.0%	0.0%	100.0%
	Potentially adequate	11	28	0	0	39
		28.2%	71.8%	0.0%	0.0%	100.0%
	Aversive – denying	0	3	1	0	4
		0.0%	75.0%	25.0%	0.0%	100.0%
	Aversive–trivializing	0	2	0	1	3
		0.0%	66.7%	0.0%	33.3%	100.0%
Total		20	35	1	1	57
		35.1%	61.4%	1.8%	1.8%	100.0%

Table 9: Impact of Emotional Status

Emotional status before	Emotional Status After Therapy				
	Energy mobilizing	**Feeling of inertia**	**Low self-esteem**	**Anxiety**	**Total**
Energy mobilizing	11	0	2	0	13
	84.6%	0.0%	15.4%	0.0%	100.0%
Feeling of inertia	15	7	1	0	23
	65.2%	30.4%	4.3%	0.0%	100.0%
Low self-esteem	1	3	9	0	13
	7.7%	23.1%	69.2%	0.0%	100.0%
Anxiety	2	3	0	3	8
	25.0%	37.5%	0.0%	37.5%	100.0%
Total	29	13	12	3	57
	50.9%	22.8%	21.1%	5.3%	100.0%

Table 10: Impact of Coping Strategies

Coping strategies before	Coping Strategies After Therapy					
	Problem-focused	**Tendency toward problem-focused strategies**	**Emotion-focused-asking for help**	**Emotion-focused – diversion**	**Emotion-focused – negative avoidant**	**Total**
Problem-focused	15	0	1	0	0	16
	93.8%	0.0%	6.3%	0.0%	0.0%	100.0%
Emotion-focused – asking for help	5	1	17	0	0	23
	21.7%	4.3%	73.9%	0.0%	0.0%	100.0%
Emotion-focused – diversion	2	0	12	2	0	16
	12.5%	0.0%	75.0%	12.5%	0.0%	100.0%
Emotion-focused – negative avoidant	0	0	1	0	1	2
	0.0%	0.0%	50.0%	0.0%	50.0%	100.0%
Total	22	1	31	2	1	57
	38.6%	1.8%	54.4%	3.5%	1.8%	100.0%

Table 11: Patient Satisfaction by Patient Conducting

Scopes of Questions	Overall (n = 108)
I. To what extent do you consider supportive therapy important?	
1. I don't think it's important	1 (1.8%)
2. I think it's less important	1 (1.8%)
3. I think it's important	28 (49.1%)
4. I think it's very important	27 (47.4%)
II. To what extent has supportive therapy contributed to increasing your knowledge: essence of infertility, causes of infertility?	
1. Therapy did not contribute to it	1 (1.8%)
2. Therapy has contributed less	7 (12.3%)
3. Therapy has contributed to it	16 (28.1%)
4. Therapy has contributed significantly	33 (57.9%)
III. To what extent has supportive therapy contributed to increasing your knowledge: describing the course of the required examinations for	
1. Therapy did not contribute to it	1 (1.8%)
2. Therapy has contributed less	5 (8.8%)
3. Therapy has contributed to it	19 (33.3%)
4. Therapy has contributed significantly	32 (56.1%)
IV. How has supportive therapy contributed to the expansion of knowledge of therapeutic options (medication, surgical, assisted reproductive procedures)?	
1. Therapy did not contribute to it	1 (1.8%)
2. Therapy has contributed less	9 (15.8%)
3. Therapy has contribute to it	13 (22.8%)
4. Therapy has contributed significantly	34 (59.6%)
V. To what extent has supportive therapy contributed to increasing your knowledge: providing information to improve health (diet, lifestyle, and physique)?	
1. Therapy did not contribute to it	1 (1.8%)
2. Therapy has contributed less	14 (24.6%)
3. Therapy has contributed to it	20 (35.1%)
4. Therapy has contributed significantly	22 (38.6%)

Figure 8: Patient Satisfaction with Supportive Therapy

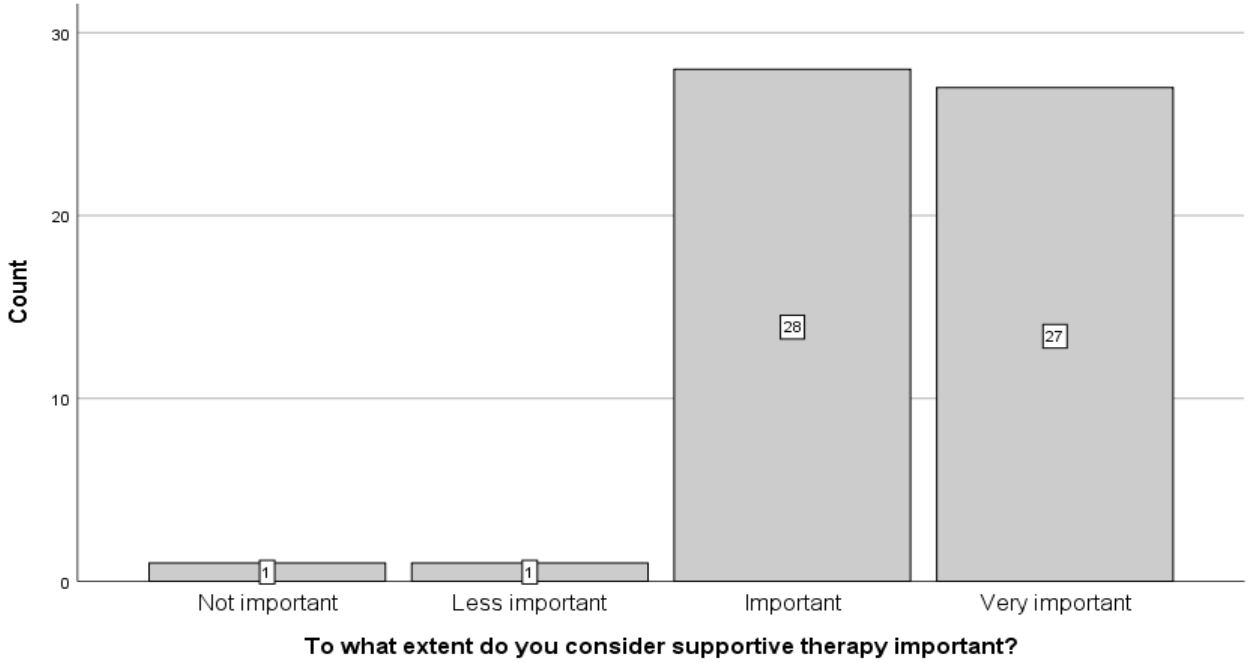


Figure 9: Patient Satisfaction with Providing Information to Improve Health (diet, lifestyle, psychology)

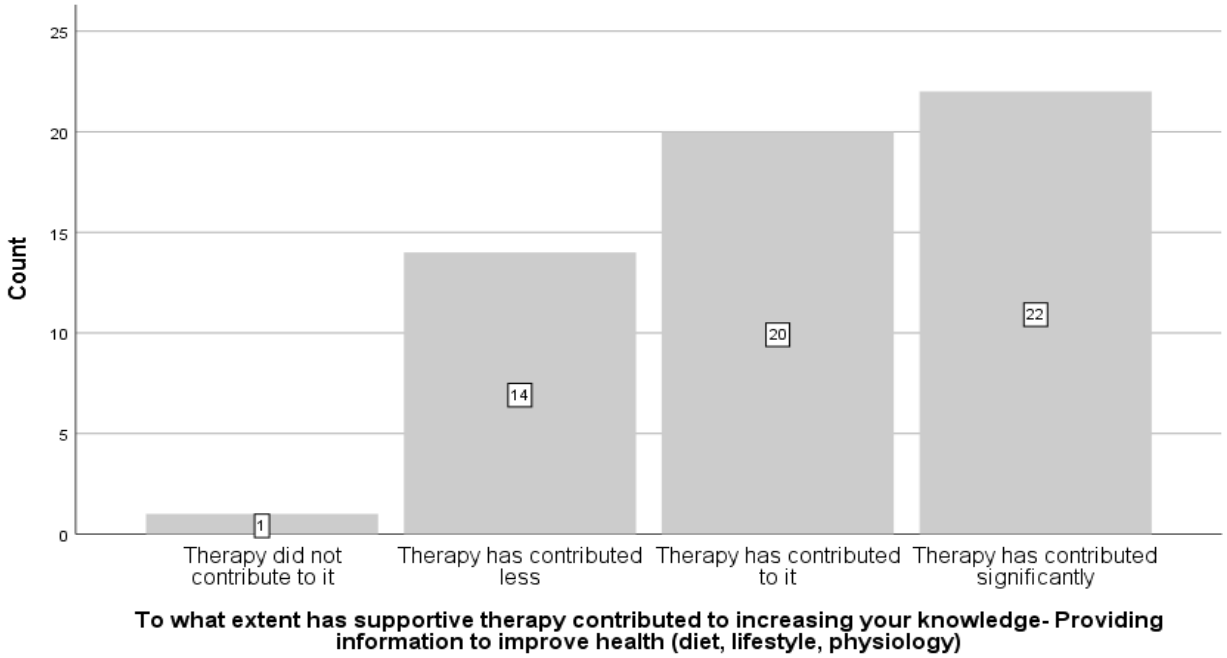
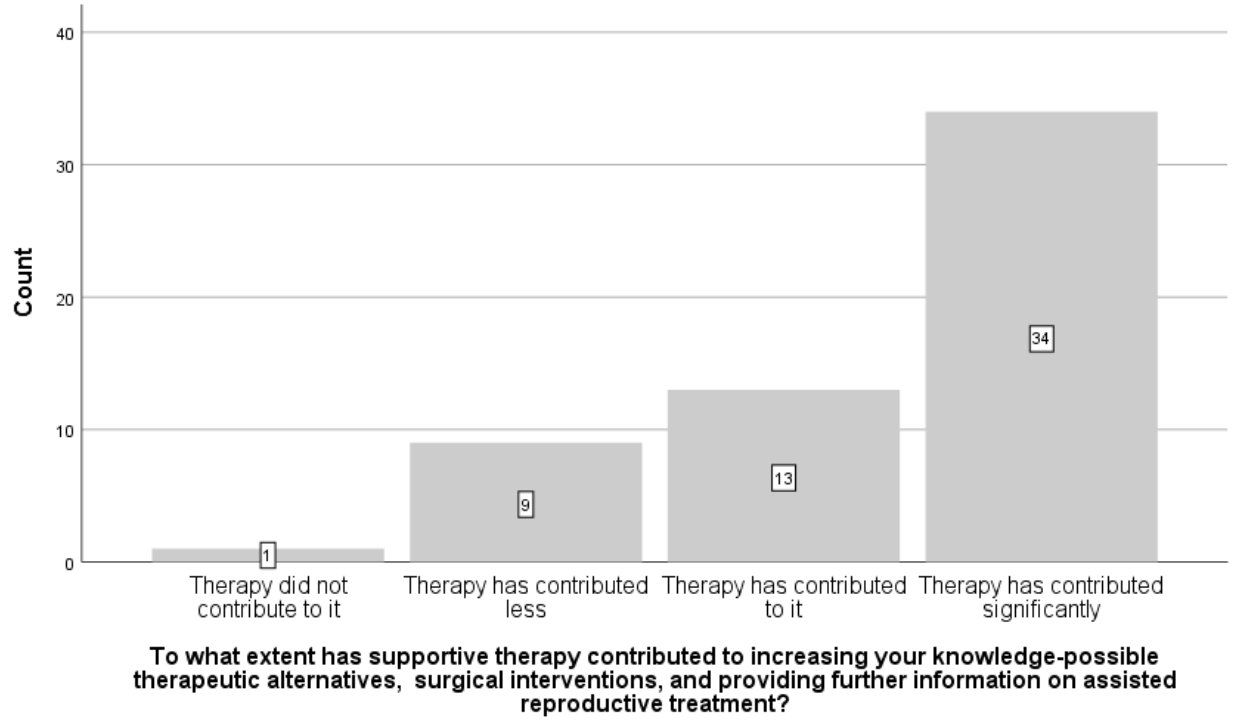


Figure 10: Supportive Therapy Contributed to Increasing your Knowledge – possible Therapeutic Alternatives, Surgical Interventions



7. Discussion

7.1 Patient Conducting to Support Problem-Focused Strategies

Our study highlighted how the group that received interventions had an intense awareness of the diagnosis and the aims and nature of the indicated treatment. This group used purposeful problem-solving coping strategies during the infertility treatment. As a result of the interventions during the fourth and fifth meeting the persons in the observed group used adaptive coping strategies, e. g. problem analysis and purposeful action more frequently. While infertility treatments can be exhaustive, the person's sense of security was increased by the transparency of examinations, by the predictability of the treatment and by the thorough knowledge of the clinic and its staff.

According to the cognitive model long-term adaptation is facilitated by problem analysis, since the person makes efforts in stressful situations with low control. Those persons who reevaluate childlessness experience significant decrease in stress levels when coping with infertility (Gameiro & Boivin, 2015; Van den Broeck, et al., 2010; Terry & Hynes, 1998).

The patients reported they were satisfied with the intervention. Their levels of depression and anxiety decreased from those observed at the start of the interventions and concurred with the control group's results.

Male infertility affects an increasing number of males in the reproductive stage of their lives. This challenges professional working with reproductive technologies and paramedical helpers. Males' coping strategies may differ from those of females. Their attitude towards diseases and frequency of seeking medical assistance also differs in comparison to females (Nikoloudikis, at al., 2016). Previous studies have revealed that infertility as a mental problem affects both members of the couple. Although several studies have examined the anxiety and coping associated with female infertility, studies of male infertility are uncommon and usually only assess their knowledge (Cserepes & Bugan, 2015; Lakatos, at al., 2017). Only a few studies have provided a solution for the non-pharmaceutical decrease of anxiety and depression, which is significant during assisted reproductive treatment.

Infertility clinics should provide their clients with more apparent and traceable treatment in order to enable them to apply more coping strategies during difficult times and to support both partners. Studies were conducted in 2010 to explore how males appreciate a supportive group during assisted reproductive treatment. The participants showed a positive reaction towards the counseling and believed they could talk about their problem in an accepting environment. It is noteworthy that those males who sought counseling suffered primarily from male factor infertility. This guided us in choosing the target group. We were curious about the patients' conditions after diagnosis and how supportive therapy could help them. Decreasing depression and anxiety is not only important for their relationship, but clinical findings also verified that there is an inverse relationship between psychological stress and the parameters of the sperms even though its effect is mainly measurable in the group of patients with decreased fertility (Wdowiak, et al., 2017; Nargund, 2015) and it can also lead to leaving the treatment. Therefore, a non-pharmaceutical decrease in anxiety and stress and providing information and coping strategies may be crucial.

Because this study was limited by the number of participants, we did not evaluate the characteristics of coping strategies in the different subgroups so as to apply personalised therapies according to their diagnosis. Consequently, this remains a goal for further studies.

In summary, with the paramedical counseling of clients with infertility problems a more favourable mental well-being can be established with the active participation of professional helpers. Patients may receive effective, targeted and problem-specific help.

7.2 The Role of Patient Conducting in Patient Satisfaction

One of the objectives of this research was to assess and improve the patient's psychological condition, provide information, process and help develop resources that patients can use to promote the processing of the resulting effects, experiences, and knowledge, with the aim of increasing patients' sense of influence and predictability.

However, there is very little support regarding the processing of effects, experiences, and knowledge during the actual treatment period. Targeted nursing interventions and programs could help improve the treatment possibilities arising from modifiable lifestyle variables that are under a person's control.

In the collaborative care process, a professional nurse must establish a relationship that has a positive effect on mobilizing patients' internal resources and regaining a sense of competence in the management of their own health (Helembai, 2019a).

Satisfaction with infertility centers and the effect of satisfaction on infertility distress was assessed in an international survey. Data was collected from four infertility centers. The results revealed that patients were satisfied with the work of the clinics. Furthermore, the information provided in relation to their problem and their relationship with their doctors was satisfactory.

Nevertheless, emotional support provided by the medical team was considered to be scarce and not much information in connection with the mental consequences of infertility was given to the patients. Although the patients generally were satisfied with the patient-doctor communication, they perceived the information provided by the institutions and professionals' willingness to be insufficient. The results of this survey supported previous experience that demonstrated that satisfaction indicators and infertility distress are closely related. The more satisfactory the medical and psychosocial information were and the more satisfied the persons were with the centre, the less pronounced infertility distress was (Daumler, et al., 2016; Hammarberg, et al., 2010; Randi, et al., 2016; Schmidt, 2003).

The results of our study, which was performed among infertile male patients, are consistent with the international data. In terms of patient satisfaction, 97% of the respondents in the observed group reported that supporting therapy was important. The men who received counseling had a positive experience in counseling and received new information. The intervention was able to increase various aspects of men's fertility awareness. Patients indicated that supportive therapy contributed significantly to the expansion of their knowledge of the root cause of their infertility.

Patients felt that they had knowledge of the course of the investigation, patients had knowledge of the therapeutic options, and patients had knowledge of health promotion.

Person-centered care should be used by all clinical staff, because lack of service can have a negative impact on the patient's psychological well-being. Biovin et al.'s research results could be attributed to the premature interruption of assisted reproductive treatments due to an increase in relationship problems, the choice of a new life goal, advanced age, or many unsuccessful attempts (Biovin, et al., 2015).

However, it is necessary that, in addition to the possible causes of infertility, couples should identify the distress that is most important. Clients have been a source of stress; the nature of the clinics, frequent changes in medical staff, an impersonal, non-supportive medical environment and, disorganized and, unpredictable treatment schedule.

The main task of patient-focused counseling is to assure that patients understand the consequences of their choice of treatment, provide sufficient emotional support and cope with the consequences of experiencing infertility in a healthy way.

8. Conclusion

The findings suggest that it is a compelling task for professionals working in assisted reproductive treatment to ensure infertility center provides a holistic approach.
Infertility centers should strive to become supportive environments where people wishing to have a child can cope with their temporary or permanent childlessness and be involved in the decision-making through professional cooperation and social acceptance.

Overall, patients with infertility problems should be provided with better psychological well-being with the active involvement of professionals. In addition, they should receive effective, targeted, and problem-specific assistance.

The basic task of patient conducting is to ensure that patients understand the consequences of their treatment choices, receive sufficient emotional support, and have the tools available to cope with the consequences of experiencing infertility in a healthy way. It is recommended that paramedical counseling be organized around the guidelines described above, in an individual and/or couple therapy form, and be available to patients throughout the treatment duration.

Using the patient conducting process and its relevant program points step by step can help patients decrease their level of anxiety while elaborating their concerns and preventing frustrating situations.

Research results suggest that (1) fewer couples are expected to interrupt their participation in the reproductive program.

With the use of patient guidance, (2) fertility awareness in infertile men can be increased.

Credible information and its processing (3) has become a little-used source of health culture development.

The supportive environment effectively contributes (4) to the maintenance of a sense of influence and predictability, allowing the patient to get through negative events and process failures and losses.

Maintaining human dignity and identity (5) can potentially reduce the vulnerability of the process of becoming a parent. Minimalization of unfavourable coping strategies and enhancing a sense of competence.

According to the findings above, we suggest that adaptations by infertility centers to provide the patient conducting process using a holistic approach is a compelling task for medical and nursing professionals working in ART.

9. Relevance to Clinical Practice

Infertility clinics should provide their patients with clear and traceable treatment in order to enable them to apply various coping strategies during difficult periods and ensure that both the female and the male partner receive support.

The patient-centered approach contributes to the development of adaptive coping strategies for stress and to the modification of direct or indirect changes in health behavior affecting reproductive health during the treatment period. Using the patient conducting process and its relevant programme can help people to decrease the level of their anxiety, share their concerns and prevent frustrating situations. The results revealed that a more favourable mental well-being can be established by the active participation of patients with infertility problems during the treatment process with the help of professional helpers using paramedical counseling. The special scope of nursing and medicine dealing with infertile male patients should devote much attention to patient conducting performed by paramedical counseling as supportive therapy. Individual support contributes to the elaboration of information, helps in coping with arising effects and experiences and helps clients to preserve their own identities and human dignity.

Interprofessional teamwork, patient-centered care, patient safety, equity in treatment quality, patient satisfaction, job satisfactions and not least cost-effectiveness depend in great measure on human factors as it is well-known that “the population problem has no technical solution” (Garrett, 1968).

The implementation of the effective patient conducting process necessitates the introduction of paramedical counseling in nursing education as new knowledge. Furthermore, societal demand urges the need for a broad diversification of the interprofessional teamwork services in clinics.

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APPENDICES

I.

ÖSSZEFOGLALÓ KÖZLEMÉNY

A férfiak férfimeddőséggel kapcsolatos ismeretei és a támogatás lehetőségei: kockázati tényezők és egyéni válaszreakciók

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A férfimeddőség előfordulása az elmúlt évtizedekben mind világviszonylatban, mint pedig hazánkban folyamatosan növekedett és egyre inkább a középpontba került. A meddőség a reproduktív korú férfiak millióit érinti. Az ismert organikus okokon túl feltételezhetően számos életviteli és környezeti tényező is hozzájárul ehhez. A meddőség biopszichoszociális elméleti modellje lehetőséget ad arra, hogy a nemzőképesség hiányát ne csak orvosi szempontból, fiziológiai problémaként értelmezzük, hanem pszichoszociális jelenségként is. A férfiak megküzdési stratégiái, információkeresési szokásai és a meddőséggel kapcsolatos ismeretei a nőkéhez hasonlóak ugyan, de a problémára adott válaszreakcióik több ponton is eltérnek. A férfimeddőség ellátásában kiemelt szerepet kell biztosítani az egészségügyi ellátók – ápolók, reproduktív orvoslás, mentálhigiénés szakemberek – által nyújtott betegvezetésnek és paramedikális tanácsadásnak mint támogató terápiának. A kezelés időszakában – az információk nyújtása mellett – az egyéni támogatás hozzájárul a keletkező hatások, tapasztalatok, ismeretek feldolgozásához, továbbá a stresszel való adaptív megküzdési stratégiák kialakításához, valamint a reproduktivitást befolyásoló egészségmagatartás-változók közvetlen vagy közvetett módosításához.
Orv Hetil. 2018; 159(31): 1263–1269.

Kulcsszavak: férfimeddőség, betegvezetés, paramedikális tanácsadás

Men's knowledge of male infertility and the possibilities for supporting therapy: risk factors and individual responses

In recent decades, the incidence of male infertility has been increasing continuously both worldwide and in Hungary and is becoming a more and more central issue. Millions of men at the reproductive age are affected by male infertility. In addition to the known organic reasons, many life-style and environmental factors can be expected to contribute to this. The biopsychosocial theoretical model of infertility allows us to interpret the lack of fertility not only from the medical point of view, but also as a psychosocial phenomenon. Men's coping strategies, health information seeking habits, and knowledge of infertility are similar to women's, but there are several different points in their responses given to the problem. So medical, nursing and other health professionals dealing with infertile male patients should devote special and high attention to patients' conducting and paramedical counselling as supportive therapy. Within the framework of this – besides giving information – the individual support contributes to the elaboration of information, arising effects and experiences, furthermore to the developement of adaptive coping strategies for stress, and to the modification of direct or indirect changes in health behavior affecting reproductive health during the treatment period.

Keywords: male infertility, patient conducting, paramedical counselling

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Rövidítések

BMI = (body mass index) testtömegindex; IVF = *in vitro* fertilizáció; WHO = (World Health Organization) Egészségügyi Világszervezet

Férfimeddőség

A fejlett országokban a párok megközelítőleg 15–20%-a szembesül az infertilitás problémakörével [1]. Európai adatok szerint folyamatosan emelkedik azoknak a pároknak a száma, amelyek meddőségi kezelésben részesülnek, és ez a tendencia hazánkban is megfigyelhető [2]. Magyarországon az önkéntelenül gyermektelen párok arányát 24%-ra becsülik, minden negyedik pár meddőségi problémával küzd [3].

Az Európai Urológus Társaság (European Association of Urology) 2017. évi férfimeddőségi szakmai irányelvei szerint a korszerű kórismézés és terápia hatására a gyermektelen nők aránya 3% lett, azon nők aránya pedig, akik nem tudnak annyi gyermeket szülni, mint ahányat szeretnének, végeredményben 6% [4]. A kumulatív terhességi arány 27%, 2 éves követéssel, azon meddő párok esetében, akiknél a meddőség elsődleges oka oligozoospermia. A nők életkora az egyetlen olyan legfontosabb változó, amely befolyásolja az eredményt az asszisztált reprodukcióban. Összehasonlítva a 25 éves nőket a 35 évesekkel, a termékenységi potenciál 50%-ra, 38 évesen 25%-ra és 40 éves kor felett kevesebb, mint 5%-ra csökken. Ismert, hogy a nők számos nyugati országban elhalasztják első terhességüket az oktatásuk befejezéséig és karrierjük megkezdéséig [4].

Mivel az utódnemzés mind egyéni, mind társadalmi szempontból kulcsfontosságú, az ezen a téren tapasztalt nehézség komoly pszichés terhet róhat a meddő pár mindkét tagjára [5, 6]. Az identitás fontos része a reprodukcióra való képesség, ezért a páciensek a meddőség megélését addigi életük legnagyobb mértékű stresszel járó eseményének tartják. Sok pár esetében meddőségük a mindennapok középpontjává válik, gyakran az élet más fontos szempontjainak kizárásával. A reprodukció feletti kontrollvesztés nagy kihívást, nehézséget jelent az érintettek számára. Az önkéntelen gyermektelenség megtapasztalásával fokozódik a szorongás, a depresszió előfordulása, ezzel párhuzamosan romlik az életminőség érzése [7, 8].

A meddőség definíciójának több megközelítése (biomedikális, pszichoszociális) létezik, legtöbbjük a meddőséget orvosi szempontból és a női test, a terhesség létre nem jöttének szemszögéből vizsgálja [9]. A WHO definícióját kisebb módosításokkal több, mint egy évtizede fogadták el, mely szerint „a meddőség a reproduktív rendszer betegsége, mikor a terhesség 12 hónap rendszeres védekezés nélküli szexuális együttlét ellenére sem jön létre”.

Az infertilitás leggyakoribb és egyértelmű organikus oka a női oldal esetében a petevezeték lezártsága [10]. Az infertilis párok esetében a vizsgálatok azt mutatják, hogy 50%-ban csak a férfi partner vagy a férfi partner is érintett a meddőség kialakulásában [4].

Az andrológia a férfiinfertilitás számos különböző etiológiai faktorát tárta már fel. Míg korábban a megtermékenyítőképesség zavarát egyértelműen hormonális problémákkal magyarázták, ma már tudjuk, hogy endokrinológiai tényezőkre a férfimeddőség eseteinek csak kis hányada vezethető vissza. A lehetséges okok között szerepelhetnek még a nemi szervek alaki eltérései (például sorvadt vagy kis méretű herék), a herék helyzeti eltérései (például hereleszállási zavarok), here-visszértágulat (varicokele), ondóúti elzáródások, gyulladások, infekciók, hormonális, genetikai, immunológiai, biokémiai kórokok, rendszerbetegségek, daganatos betegségek és azok kezelései, valamint egyéb külső károsító tényezők (például tartós hő, vibrációs ártalom stb.) hatásai is [11]. A rosszindulatú daganatos betegségek műtétes, sugár-, kemo- és biológiai kezelése káros hatással lehet a fiatal betegek későbbi fertilitási képességeire. A javuló gyógyulási esélyek mellett egyre nagyobb hangsúlyt kap a betegek hosszú távú életminősége, így a túlélésen túl jövőbeli fertilitásuk megőrzése [12].

A fenti problémák kizárása után is gyakran mutatkozik eltérés az egyes spermaparaméterek (spermiumkoncentráció és -mozgás, morfológiai jellemzők) tekintetében, ám ezek oki háttere még nem teljesen tisztázott; a környezetszennyezés kapcsán az endokrin disruptorok, valamint a relatív oxigén-szabadgyökök szerepét is feltételezik.

Az Európai Urológus Társaság 2017. évi férfimeddőségi irányelvei szerint az ismeretlen eredetű (idiopátiás) meddőség az összes eset 31%-át teszi ki [4]. Az ismeretlen kóreredetű meddőség kialakulásában és fennmaradásában a korábbi évtizedekben jelentős szerepet tulajdonítottak az egyén és/vagy a pár pszichopatológiájának, ezáltal összevonva a pszichogén és az ismeretlen eredetű infertilitást. Az 1950-es években, amikor még a pszichopatológiai szemlélet volt az uralkodó, az esetek nagyjából 50%-ára nem tudott az orvostudomány érvényes magyarázatot adni, és ez a pszichológiai faktorok szerepének túlhangsúlyozásához vezetett; a koncepció nagyjából az 1980-as évekig egyeduralkodó maradt. Az 1990-es évektől a bizonyítékokon alapuló orvoslás hangsúlyozza, hogy az ismeretlen eredetű infertilitás és a pszichogén meddőség közé nem tehető egyenlőségjel. Napjainkban a legtöbb kutató elutasítja a pszichoszociális faktorok kizárólagos szerepét a meddőség patogenezisében, de elfogadja a lelki tényezők jelentőségét a fertilitási problémák kialakulásában, fennmaradásában, illetve a meddőségi kezelés eredményességében. Az infertilitás biopszichoszociális elméleti modellje tehát lehetőséget ad arra, hogy a meddőséget ne csak orvosi szempontból, fiziológiai problémaként értelmezzük, hanem pszichoszociális jelenségként is, valamint a pszichés tényezők potenciális szerepét a kezeléseknél, a betegség alakulásában is figyelembe vegyük [13].

Ismert a férfieredetű meddőség kifejezett hatása a férfi lelkiállapotára, így depressziós és szorongásos tüneteinek fokozódására [6, 14].

A férfiak jelentős distresszt tapasztalhatnak, amikor szembesülnek a meddőséggel, és valószínűleg a szorongás, a csökkent önértékelés és a társadalmi megbélyegzettség érzése erősebb a férfifaktoros meddőségben, mint az ismeretlen eredetű vagy női faktorú meddőség esetében [15]. A férfiasság és az emberi reprodukció biológiai és kulturális antropológiai elméletének áttekintői ugyancsak arra a következtetésre jutottak, hogy a meddőség potenciálisan megalázó a férfiakra, ami kedvezőtlen hatással van a férfiasságra, és stigmatizálóbb, mint a nők számára. Feltehetőleg azért, mert a férfiak képesek összeolvasztani a meddőséget, a virilitást és a szexuális teljesítményt, ami a személyes elégtelenség érzékeléséhez vezethet [16]. Ezek a tapasztalatok arra hívják fel a figyelmet, hogy az ellátás során a férfiak támogatása is szükséges, valamint érzékeny és egyedi megközelítésre van szükség.

Életmód és egészségmagatartás

A férfiak egészségi állapotáról – feltehetőleg a társadalom beállítottsága miatt – kevesebb szó esik hazánkban, mint a nőkéről. A magyar férfiak körében magas a 49 és 65 éves kor között bekövetkező, idő előtti halálozás, aminek hátterében az átalakuló társadalom krónikusstresszforrásai és a stressz levezetésére szolgáló rizikómagatartások állnak [17]. A meddőség a WHO legfrissebb definíciója alapján – orvosi megközelítés szerint – betegségnek számít, így a párok orvosi ellátásra jogosultak [18]. A betegstatust azonban a páciensek nagy része rosszul éli meg, hiszen itt lényegében egészséges férfiakról és nőkről van szó.

Az utóbbi évtizedekben hangsúlyossá vált az életmódváltozók mint kockázati tényezők hatása a reproduktív egészségre. A növekvő tudományos érdeklődés oka feltehetőleg abban keresendő, hogy az életmódváltozók döntően a személy kontrollja alatt álló és többé-kevésbé módosítható tényezők közé sorolhatók.

A termékenységi mutatókat kedvezőtlenül befolyásolja az obesitas azzal, hogy az spermaminőség romlását (spermiumkoncentráció és -motilitás csökkenése) okozza. Az átlagosnál nagyobb testtömeg az erectilis diszfunkció vezető kockázati tényezője [19]. A túlsúlyos férfiak esetében a nemi hormonprofil megváltozása (csökkent androgénértékek magas ösztrogénszint mellett) a spermatogenezis romlásával járhat együtt [20, 21].

Sallmén és mtsai (2008) azt vizsgálták, hogy a testtömeg milyen módon hat a fertilitásra. 2011 pár vizsgálata alapján azt találták, hogy a meddőség aránya nagyobb a férfiak azon csoportjában, amelyben a testtömegindex (body mass index, BMI) is nagyobb. A 20 és 22 közötti BMI-indexű férfiak csoportjához képest már háromegységnyi emelkedés is jelentősen megnövelte a meddőség kockázatát [22]. A túlsúlyosság hatását vizsgáló tanulmányok szerint a testtömegcsökkenés pozitívan hat a spermaanalízis mutatóira: a spermiumkoncentráció, valamint a normál morfológiájú spermiumok arányának szignifikáns mértékű növekedésével jár együtt [23].

A testsúly természetesen nem független a táplálkozási szokásoktól. Az erre vonatkozó kutatási eredmények szerint szénhidrátokban, rostokban gazdag étrend, megfelelően magas folsav-, likopin- és C-vitamin-szint és kisebb mennyiségű fehérje- és zsírbevitel jellemezte a normálspermaképet mutató férfiak csoportját a csökkent spermaminőségű csoporthoz képest. Feltehetőleg az alacsony antioxidánsbevitel gyakorol negatív hatást az ismert spermaparaméterekre [24].

A dohányzás többek között a szív- és érrendszeri betegségek kockázati tényezője, ugyanakkor az infertilitás tekintetében is rizikófaktornak számít. A dohányzás negatívan hat a spermaminőségre – a koncentráció-, a motilitási és a morfológiai mutatók tekintetében – az egészséges és a meddő férfiak esetében egyaránt [25]. A tesztoszteronszint csökken, növekszik az erectilis diszfunkció kialakulásának veszélye, és sok esetben romlanak a spermaparaméterek [26].

A rizikómagatartások közül a dohányzás mellett kiemelendő az alkoholfogyasztás – mindkettő szintén negatívan befolyásolja a férfiak termékenységét.

Az alkohol szignifikánsan csökkenti az ejaculatum mennyiségét, és a minőségi mutatókra (motilitás, morfológia) is negatívan hat. Egy 100 fős mintán végzett vizsgálatban a mérsékelten ivók 63%-ánál és a nagyivók 72%-ánál a hímivarsejtek alaki, morfológiai károsodását (teratozoospermia), 54%, illetve 64% esetében csökkent spermiumszámot mutattak ki [25].

A testmozgás egészségvédő hatása a termékenység kapcsán is megmutatkozik. Egészséges férfiak esetében a hetente legalább háromszor egy óra sportolás kedvező hatást gyakorol a spermaminőségre, főként a morfológiai mutatókra [27]. A mértékletes testmozgás közvetett hatásai révén is kedvezően hat a termékenységre.

A túlzott gyakoriságú és intenzitású testmozgás hatása azonban már nem ilyen kedvező. *In vitro* fertilizációban (IVF) részt vevő férfiak közül azoknál, akik hetente öt vagy több órát kerékpároztak, alacsonyabb spermiumkoncentrációt mértek, mint a hasonló mozgásformát nem folytatóknál [28].

A férfimeddőségre adott reakciók aspektusai

A gyermekvállalás fontos kérdés az egyén, a család és a társadalom szempontjából egyaránt, így érthető, hogy annak sikertelensége csalódást, kudarcot és frusztrációt jelent az érintettek számára. Különösen így van ez akkor, ha a fogantatás tartósan késik vagy egyáltalán nem valósul meg. Ha egy párnak szándéka ellenére nem születik gyermeke, és az erre irányuló vágyaik és erőfeszítéseik sorra eredménytelennek bizonyulnak, a meddőség megélése paranormatív krízist okozhat az érintett férfiak életében, mely depresszív és/vagy szorongásos tünetek megjelenésével, az önértékelés csökkenésével és a társas

tér beszűkülésével járhat együtt. Negatívan befolyásolhatja a párkapcsolat minőségét, a munkaképességet, sőt kihathat a személy jövőképére, élete értelmének a megélésére is. E negatív lelkiállapotok külön-külön is jelentősen csökkenthetik a személy életminőségét és káros egészségmagatartások kialakulásához is vezethetnek (például dohányzás, túlzott mértékű alkoholfogyasztás) [29, 30]. A gyermekáldás érdekében vállalt erőfeszítések gyakorta hosszú időn át tartó, lelki és fizikai szempontból egyaránt megterhelő élethelyzetet teremtenek, amely felerősíti e negatív érzelmek intenzitását, továbbá kihívást jelent az énkép, az önbecsülés és a saját férfiasság/nőiesség megélése szempontjából. Mindezek mellett a családalapításra vonatkozó társadalmi nyomás és a külső elvárások feszültségkeltő hatása sem hagyható figyelmen kívül [31]. A férfimeddőség kapcsán empirikusan legtöbbet kutatott kérdés az, hogy általában véve a stressz, illetve a fogantatás elmaradásából származó érzelmi feszültség miként hat a gyermeknemzés esélyeire. A stressz és az infertilitás összefüggését tekintve az alapvető kérdésfeltevés az, hogy vajon a stressz okozza-e a meddőséget, illetve hozzájárul-e annak kialakulásához, vagy a meddőség ténye és tudata okozza a stresszt, esetleg maga a meddőségi kezelés játszik szerepet stresszfaktorként. Egyre több a bizonyíték arra vonatkozóan, hogy a stressz fontos kockázati tényezőt jelent az infertilitás szempontjából. A meddőség emeli a distressz szintjét, ami az endokrin folyamatok, a szérumprolaktinszint emelkedése révén tovább rontja a fogantatás esélyeit [30].

A gyermek utáni vágy fokozódása olyan krízist jelent, amely lelki, fizikai és szociális hatással bír. A kivizsgálások és a meddőségi kezelések esetleges vállalása szintén jelentős mértékű megterhelést jelenthet az egyén és a pár számára egyaránt. Az asszisztált reprodukció kapcsán végzett kivizsgálás és kezelés során a lelki megterhelés fokozódik, a páciensek párkapcsolata 14%-ban a terápia folyamán felbomlik [32].

A szakszerű pszichés vezetés egyre hangsúlyosabb szerepet tölt be a meddő párok ellátásában [33].

Ebben a fokozottan stresszkeltő élethelyzetben fontos az adaptív megküzdési (coping) stratégiák alkalmazása, amelyek során az egyén megpróbálja csökkenteni a stressz által okozott negatív hatásokat. Ilyen stresszfaktor lehet többek között a meddőség, a csökkent nemzőképesség, valamint az asszisztált reprodukciós kezelések vállalása. A megküzdésre számos stratégia létezik. Az egyik gyakran használt felosztás megkülönböztet problémaközpontú és érzelemközpontú megküzdést [34]. Az előbbi során az egyén megpróbálja megelőzni vagy megváltoztatni a fenyegetéseket, a stresszhelyzetet. Ha az egyén ezt a stratégiát követi, odafigyel az életmódjára, egészségesen étkezik, rendszeresen sportol, ezzel megpróbálja elkerülni a spermaparaméterek további romlását. Ugyanakkor az érzelemközpontú megközelítés esetében az egyén a helyzet okozta érzelmi reakciókat próbálja csökkenteni azáltal, hogy nem vesz tudomást a problémáról, elbagatellizálja azt, valamilyen pótcselekvést végez, esetenként alkoholizálásba vagy más függőségbe menekül, ami a spermaparaméterek további romlását okozhatja. Az érzelemközpontú stratégia célja fékezni a negatív érzelmek elhatalmasodását, illetve a probléma megoldásának elhalasztása. Az érzelemközpontú kérődző stratégiát alkalmazó személy gyakran aggódik a jövő miatt, bánkódik, önsajnálatba merül, miközben semmit nem tesz a megoldás érdekében.

Felvetődhet a kérdés, hogy vajon a probléma vagy az érzelemközpontú megküzdési stratégiák eredményesebbek-e a férfimeddőséggel való megküzdésben. A válasz függ a meddőségi kezelés szakaszaitól: egy újonnan diagnosztizált fertilitási probléma esetében más megküzdési mód lehet adaptív, és más a kezelés különböző szakaszaiban [35]. Az érzelemközpontú kérődző megküzdés az infertilitás diagnózisával való szembesülést követően adaptívnak mondható, mivel a veszteség feldolgozásához időre van szükség. Ez a stratégia alkalmas a keletkezett érzelmi feszültség csökkentésére, valamint időt ad a rendeződésre, majd ezt követően a beteg eredményesen képes alkalmazni a problémaközpontú megküzdési stratégiát. A férfiak esetében a tervezést, azaz a problémaközpontú megközelítést, valamint a problémától való távolságtartó stratégia használatát tartják a legeredményesebbnek [35, 36].

Az észak-amerikai infertilis párok körében a férfiaknak összességében gyengébb, alacsonyabb a megküzdési stratégiájuk. Hajlamosak megbirkózni a ténnyel azáltal, hogy a munkában és más tevékenységekben való részvételüket növelik, optimistábbak, problémamegoldóbbak, és kevésbé igénylik a szociális támogatást. A férfiak könnyebben állnak át a gyermek nélküli életmódra, mint partnereik, akiknek nehezebb megoldaniuk a meddőség problematikáját. A férfiassági normáknak megfelelően sok férj hajlamos elnyomni érzelmeit a felesége támogatása érdekében [36]. Ez a tendencia azzal is járhat, hogy a férfiaknál a meddőséggel összefüggő szorongás tényleges szintje alulértékelt.

A kutatási eredmények szerint a férfiaknak általában gondot okoz, hogy korlátozott lehetőségeket látnak a meddőségi probléma megoldására vagy akár arra, hogy abban a párjuknak segítséget nyújtsanak. Ez a tehetetlenség azután a saját hatékonyságuk érzésének csökkenéséhez és fokozott stresszhez vezet. Nem érzik magukat képesnek arra, hogy a problémát egyedül megoldják, nem tudják, pontosan mit tehetnének a megoldás érdekében. A szégyen, a bűntudat, a haszontalanság érzése, a félelem és a kétségbeesés a felszín alatt erősödik a férfiban, amiért már nem ő az uralkodó a családalapítás miléntje és időzítése felett [30, 37]. A tervezés azért számít az adott élethelyzetben adaptív megküzdési módnak, mivel a probléma kezelésére vonatkozó stratégia felépítése, a célirányos cselekvések sorának megtervezése növeli a kontroll és a kompetencia érzését, és segít abban, hogy a pár közös erőfeszítéseket tegyen a helyzet megoldására [35].

A vizsgálatok eredményei szerint az infertilitás vonatkozásában az elkerülés – azaz elkerülni a meddőségre

emlékeztető helyzeteket és személyeket –, valamint az önhibáztatás elégtelen megküzdési stratégiák. Mindkettő a stressz magas szintjével jár együtt, és a szorongásos-depressziós tünetek megjelenésének prediktív tényezői [35, 36].

Paramedikális tanácsadás mint támogatási lehetőség a férfimeddőségben

A kedvezőtlen egészségmagatartás megváltoztatását célzó intervenciók és programok hatékony elemei lehetnek a meddőség kezelésének. Ugyanakkor az is elmondható, hogy a lelki tényezők hatása a fertilitási problémák kialakulására és fennmaradására ma már nem vitatható. A gyermektelenség megélése sokszor kultúrától függetlenül hasonló jegyeket mutat; szégyen, bűntudat, a haszontalanság érzése, a bizonytalanság átélése és az önértékelés fenyegetettségének érzése [30, 37].

Az infertilitás, illetve a társbetegségek megfelelő kezeléséhez, az esetleges szövődmények megelőzéséhez a betegeknek számos új ismeretet, készséget kell elsajátítaniuk. Mint társadalmunk modern betegei, a páciensek aktívan részt akarnak venni saját gyógyulásuk folyamatában, valamint az ezzel kapcsolatos döntésekben, és ehhez egyre több információt kérnek és várnak el az egészségügyi ellátóktól [38]. Az egészségügyi információ keresése általában a házas, középkorú nőkre jellemző [39]. A férfiak a meddőséggel kapcsolatos információkkal korlátozottan rendelkeznek, a tanácsokat, információkat szívesebben fogadják írásban, továbbá bizonyított, hogy meddőség esetén, valamint kisebbségi csoportokban motiváltabbak az információk megszerzésében [40].

Ha nemcsak információt szeretnénk adni, hanem valamilyen változás fontosságáról szeretnénk meggyőzni a pácienst, és egyúttal motiválni szeretnénk arra, hogy változtasson életmódján, akkor figyelembe kell vennünk a pszichés tényezőket, valamint a beteg már meglévő ismereteit.

Ezek az információk számos csatornán elérhetők, főként az internet kínál könnyen hozzáférhető lehetőségeket. A megbízhatóság és a minőség azonban nem mindig biztosított. Általában az orvoshoz fordulás után keresnek a meddőségben szenvedő férfiak információkat mintegy segítségként a döntéshozatalban [41]. Ismereteiket leginkább online elérhető forrásokból szerzik, amelyeket elsősorban Google-keresésekkel és a közösségi médián keresztül (Facebook) érnek el [42].

A sikertelen gyermekvállalás során a férfiaknál is megjelenik a meddőségre adott specifikus szorongás, szomorúság. A patozoospermiával vagy azoospermiával diagnosztizált férfiak többnyire bánatot, szégyent, partnerükkel szemben bűntudatot éreznek [37]. Ennek ellenére nem szívesen fordulnak mentálhigiénés szakemberhez vagy önsegítő csoportok felé [29]. Jelentősen jobb hatásfokú a személyre szabott betegoktatás, ha a személyes konzultációk során minden beteg az előzetes tudásának, műveltségének, aktuális szükségleteinek és pszichoszociális állapotának megfelelő formában jut hozzá az információhoz [43].

A meddőséget kiváltó kockázati tényezők prevenciójában lényeges a megfelelő motivációk kialakítása annak érdekében, hogy a betegek képesek legyenek például a javasolt életmódbeli változtatásokat végrehajtani.

A tanácsadási stratégiák alkalmazásával lehetővé válik az információk befogadása, új készségek fejlesztése, új szokások kialakítása [44, 45].

A tanácsadási stratégiák ahhoz nyújtanak segítséget, hogy a közvetíteni kívánt ismereteket az érintettek be tudják illeszteni saját szemléleti és tapasztalati rendszerükbe, valamint ahhoz, hogy a betegek és hozzátartozóik valós képet alkothassanak a jelen helyzetükről, amely igen gyakran túlzottan is közeli ahhoz, hogy a segítő és gátló tényezőket, továbbá a rendelkezésre álló lehetőségeket reálisan felmérhessék [46].

Egy 2001. évi tanulmány a termékenységi szolgáltatásokat nyújtók számára összefoglaló iránymutatást ad a tanácsadásra és a pszichoszociális ellátásra vonatkozóan. A munka a személyközpontú ellátás és a tanácsadás, rutinszerű kezelések integrálására összpontosít, rámutatva néhány olyan speciális helyzetre, amely a tanácsadás szükségességét igényelheti (például a kezelés befejezése, szexuális problémák). A meddőségi klinikák megfelelő gyakorlata magában foglalja a holisztikus ellátást.

A klinikáknak, meddőségi centrumoknak készen kell állniuk arra, hogy figyelembe vegyék és kezeljék azokat a pszichoszociális kérdéseket, amelyekkel gyakorta szembesülnek azoknál a párokkal, akik igénybe veszik szolgáltatásaikat. A betegközpontú tanácsadás alapvető feladata annak biztosítása, hogy a betegek megértsék kezelésük választásának következményeit, elegendő érzelmi támogatást kapjanak, és egészséges módon megbirkózzanak a meddőség megtapasztalásának következményeivel.

A betegellátás holisztikusabb megközelítését alkalmazva az egészségügyi eredmények javulnak, növekszik a páciensek és az ellátóteam elégedettsége, csökkennek a negatív pszichoszociális reakciók, a betegek jobban megértik tapasztalataikat [47].

A férfiak érzelmi jóllétének felmérése, valamint nyomon követése a kezdeti értékeléskor és a kezelés folyamán hasznos lehet. A meddőségben az érzelmi szükségletek spontán feltárása és az explicit támogatáskeresés, úgy tűnik, nem gyakori a férfiak között. Néhány kutató ezért javasolja a mentális egészség szisztematikus értékelését a pszichometriai kérdőívek és a kezelési protokollok segítségével. Megfogalmazódik továbbá egy olyan, első vonalbeli klinikai stratégia kialakításának szükségessége is, amely mentális egészségügyi szakemberek bevonásával potenciálisan csökkentheti a társadalmi elszigeteltséget és szorongást, valamint segíthet azoknak a férfiaknak az alcsoportjában, akik nem hozták nyilvánosságra helyzetüket házastársukon kívül bárkinek, akik reménytelennek vagy túl súlyosnak ítélik meg a helyzetüket [48]. Intervenciók és célzott programok szükségességét feltáró tanulmányok eredményei arra utalnak, hogy a meddő-

ségi szolgáltatások körében végzett átfogó klinikai ellátás különös jelentőséggel bír az érzelmi jóllét védelmében az infertilitás által érintett férfiak körében. A férfiak egyre valószínűbben bíznak meg valakiben, vágynak információra és érzelmi támogatásra [49].

Következtetés

A fentiek alapján nyilvánvaló, hogy a férfimeddőség ellátásában kiemelt szerepet kell biztosítani a támogató terápiának, amelynek fókuszában az információ nyújtása mellett a kezelési időszakban keletkező hatások, tapasztalatok, ismeretek feldolgozásának támogatása, a stresszel való adaptív megküzdési stratégiák kialakítása, valamint a reproduktivitást befolyásoló egészségmagatartásváltozók közvetlen vagy közvetett módosítása kell, hogy álljon. Annak ellenére, hogy az orvoslás számtalan hatékony beavatkozási lehetőséggel rendelkezik az infertilitás leküzdéséhez, tapasztalható és gyakran nehezen értelmezhető az érintettek kezelésének „elakadása" vagy a személyek kilépése az ellátási folyamatból.

A betegek kilátásairól szóló kutatás szisztematikus vizsgálata azt mutatja, hogy nagyon kevés tanulmány összpontosít a férfiak termékenységi ellátása során megszerzett tapasztalatokra. A férfiak beszámolói alapján a releváns dimenziók az összes meddőségi szolgáltatást igénybe vevőkre vonatkoztak, és a következő paramétereket tartalmazták: a szolgáltatásokhoz való hozzáférés; értékek tisztelete; választások és igények; az ellátás folyamatossága és összehangolása; megfelelő tájékoztatás és oktatás; fizikai kényelem; szorongás csökkentése és a partnerek bevonása. A szerzők arra a következtetésre jutottak, hogy kevés bizonyíték áll rendelkezésre a férfiak gondozására vonatkozóan, különösen az invazív eljárásokat megelőző információnyújtás vagy akár a pszichés támogatás tekintetében [50].

Számos vizsgálat tárta fel azt a tényt is, hogy a meddőség megélése paranormatív krízist okozhat az érintett férfiak életében, amely depresszív és/vagy szorongásos tünetek megjelenésével, az önértékelés csökkenésével és a társas tér beszűkülésével járhat, amelyek mérsékléséhez a pszichológiai gondozás értékes támogatást nyújthat. A tényleges kezelési időszakban keletkező hatások, tapasztalatok, ismeretek feldolgozásának támogatására azonban igen kevés figyelem irányul. Gyakorlatilag hiányoznak azok a célzott intervenciók és programok, amelyek az ápolás területén segíthetnék az orvosi ellátás folyamatával összefüggő, a személy kontrollja alatt álló, többékevésbé módosítható életmódváltozókból eredő lehetőségek hasznosítását. Kiemelten figyelmet érdemel ezért az ápolói betegvezetés [51–53] és a paramedikális tanácsadás alkalmazásában rejlő lehetőségek feltárása a kezelési időszakban [54]. Az együttműködésen alapuló gondozási folyamatban a professzionális ápolónak olyan kapcsolatot kell kialakítania, amelynek légköre kedvezően hat a beteg belső erőforrásainak mozgósítására, a kompetencia érzésének visszanyerésére saját sorsának irányításában és a saját egészsége menedzselésében. Célunk az információ nyújtásán, azok feldolgozásának és a döntés kialakításának támogatásán túl a betegekben lévő erőforrások aktivizálása és összpontosításának segítése a keletkező hatások, tapasztalatok, ismeretek feldolgozásának elősegítése érdekében, amely tevékenység többek között a biztonságos betegellátás egyik meghatározó tényezőjeként is tekinthető.

Anyagi támogatás: A közlemény megírása anyagi támogatásban nem részesült.

Szerzői munkamegosztás: Sz. A.: Hipotézisek, vizsgálati kérdések kidolgozása, szakirodalmi másodelemzés, a kézirat szövegezése. F. Zs.: Szakirodalmi másodelemzés, a kézirat szövegezése. K. I.: A kézirat szövegezése. A cikk végleges változatát mindhárom szerző elolvasta és jóváhagyta.

Érdekeltségek: A szerzőknek nincsenek érdekeltségeik.

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Adaptive coping strategies in male infertility, paramedical counselling as a way of support

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ABSTRACT

Aims: In the last decades, the number of infertile males increased worldwide which gained more focus. The extent to which a person or a couple is able to cope adaptively with the problem of infertility depends on the combined effect of several variables. Our aim was to apply counselling among males suffering from infertility problems. During the therapy – besides providing information – we aim to elaborate the effects of the treatment and experiences, to process information, to develop adaptive coping strategies against stress and to indirectly or directly change health behaviours influencing reproduction.

Methods: Only patients with male factor infertility were involved. They were divided into an observed group (n = 57) and a control (n = 51) group after a thorough physical examination and assessment of their reactions to, and awareness of, the disease.

Results: The group that received the interventions had an intense awareness of the diagnosis and aims and nature of the indicated treatment. They employed purposeful problem-solving coping strategies, reported being satisfied with the infertility treatment.

Conclusions: The counselling of clients with infertility problems a more favourable mental well-being can be established by the active participation of professional helpers. Patients might receive effective, targeted and problem-specific help.

Abbreviations: ART: Assisted Reproductive Technology

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Introduction

Reproduction is essential, both individual and social difficulties in this area place an immense psychological burden on the infertile couple (Chiaffarino et al., 2011;

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Kahyaoglu & Balkanli, 2015). Almost 15–20% of couples in developed countries face the problem of infertility (A Policy Audit on Fertility, 2017). According to European data, the number of couples receiving infertility treatment is increasing. Studies have shown that in 50% of infertile couples, only the male partner or both partners are affected (Jungwirth et al., 2017).

The branch of andrology has described several aetiological factors of male infertility. Possible causes include morphological or positional alterations of the reproductive organs. After excluding these factors, an alteration in the parameters of the sperms (concentration, motility, and morphology) often persists although its cause is not entirely clear yet. Consequently, the role of endocrinological disruptors due to pollution and relative oxygen species is assumed (Schill, Comhaire, & Hargreave, 2006).

Being able to reproduce is an important part of one's identity. Consequently, patients experience infertility as a major stressful life event. Being unwillingly childless increases the occurrence of anxiety and depression and concurrently, decreases the quality of life (Cserepes, Kőrösi, & Bugan, 2014; El Kissi et al., 2013). Males experience significant distress when they experience infertility. Furthermore, anxiety, a decrease in self-esteem and stigmatisation may be more prominent in male factor infertility than in idiopathic or female factor infertility (Furman, Parra, Fuentes, & Devoto, 2010; Petok, 2015; Throsby & Gill, 2004).

Reactions to male infertility

Literature differentiates between crises caused by unsuccessful reproduction and other stressful life events. The former is referred to as infertility distress. Facing the diagnosis, medical treatments and other difficulties associated with a life without children may be the couple's most stressful life event. The degree of infertility distress may vary individually and in relation to the time elapsed since the diagnosis. During the first year of treatment, patients tend to report high levels of stress, which is normalised during the second year and significantly increased from the third year (Martins, Costa, Peterson, Costa, & Schmidt, 2014; Pook & Krause, 2005).

The most studied question in relation to male infertility is how stress and emotional tension affect the chances of reproduction. An increase in the desire to have a child may cause negative mental, physical and social effects. The primary questions when studying the relationship between stress and infertility are whether stress causes infertility, whether it contributes to its occurrence, whether the fact and knowledge of infertility cause stress and whether the infertility treatment acts as a stress factor. Increasing evidence has supported the notion that stress is an important risk factor in the development of infertility. Infertility increases distress, which by endocrinological pathways by increasing serum prolactin levels further decreases the chances of conception (Greil, Slauson-Blevins, & McQuillan, 2010; Martins et al., 2014). Accepting examinations and infertility treatment may also place a significant burden on both the individual and couple. During the examinations and treatment for assisted fertility, their mental burden is likely to increase and 14% of couples separate (Martins et al., 2014). Emphasis has been placed on professional psychological assistance during the treatment of infertile couples (Boivin & Gamerio, 2015; Hakim, Newton, MacLean-Brine, & Feyles, 2012).

Coping strategies

It is imperative to apply adaptive coping strategies in this markedly stressful situation in order to try to alleviate the negative effects of stress. How the individual or the couple copes adaptively with the problem of infertility and/or childlessness is dependent on various factors. These factors include the cause and nature of the infertility, the available individual's mental resources, the extent of available social support and the applied coping strategies. Knowledge about the psychology of coping leads to more possibilities to develop a person-centred and effective supporting programme. The method of help should be adjusted to the nature of the problem and the individual's needs and expectations (Furman et al., 2010; Peterson et al., 2012; Petok, 2015; Van den Broeck, Emery, Wischmann, & Thorn, 2010).

Infertility is a chronic state of stress, which causes difficulties in adaptation (Peterson, Newton, Rosen, & Skaggs, 2006). Lazarus and Folkman (1984) cognitive coping model proposes that successful coping in a stressful state depends on how the person assesses their own situation and whether they are able to choose appropriate coping strategies.

Two main strategies can be identified in Lazarus and Folkman (1984) classic model: Problem-focused and emotion-focused coping. Following this model, several studies confirmed that in infertility, emotion-focused coping tends to be adaptive because it is a low-control stressor for the person (Faramarzi et al., 2013; Peterson et al., 2006).

Terry and Hynes (1998) emphasised that problem-solving may also be effective. Planful problem-solving, that is, a problem-focused strategy and distancing were found to be the most effective in males (Farmarzi et al., 2013; Peterson et al., 2006). Planful problem-solving may be adaptive because modelling a strategy to solve the problem and planning the steps to reach the purpose increases feelings of control and competence and further helps the couple in their joint effort to solve the problem (Peterson et al., 2006).

The findings noted reveal that exchanging maladaptive coping strategies for adaptive strategies should be an important aim of infertility treatments.

Infertility counselling: providing help during assisted reproductive treatment

Menning (1980) was the first to draw attention to the importance of providing psychosocial support during infertility treatment. Infertility counselling is a multidimensional task with three pillars: Support, providing information about the treatment and evaluation, which entails screening psychological vulnerability (Covington & Burns, 2006; Petok, 2015; Stammer, 2002).

The main aim of assistance is emotional support. Several studies have revealed that infertility treatment may be likened to an emotional roller coaster (Verhaak, Lintsen, Evers, & Braat, 2010; Wischmann, 2013). Consequently, it is imperative to provide possibilities for emotional ventilation and adjusting appropriate support during the phases of treatment. Mobilising coping strategies are also important in many instances, counselling is the time to address the losses that the patients have experienced during unsuccessful treatments.

To involve a patient in decision-making enhances personal control and feelings of self-efficacy and thus, frustration during the treatment may be decreased. Furthermore, it is crucial that professionals providing help emphasise adaptive health behaviours (O'Donnell, 2007; Randi, Fürbringer, Schmidt, & Pinborg, 2016; Van den Broeck et al., 2010).

During the evaluation, while screening psychological vulnerability, the professional providing help should monitor the patient's level of distress, emotional state, level of anxiety, depression and stress (Boivin, Takefiman, & Braverman, 2011; Domar, 2015; Van den Broeck et al., 2010; Verhaak et al., 2010). Several infertility distress studies emphasise (Wischmann et al, 2013) that a smaller subgroup can clearly be identified among those who suffer from infertility, these persons are significantly more vulnerable psychologically, especially they are more prone to depression and anxiety. This subgroup is the most endangered when assessing mental coping. When developing preventive psychological help the identification of this subgroup should be paid special attention in order to yield appropriate psychological treatment to those who are more sensitive to stress (Darwiche et al., 2002; Emery, Béran, Darwiche, Oppizzi, & Germond, 2003).

Besides a general person-centred approach, more focused psychosocial support is also required during the entire period of treatment. Infertility counselling could be conducted by professional helpers such as mental hygienists and nurses who are familiar with psychology, infertility and assisted reproductive treatment. The infertility professional should use the parameters described previously for individuals or couples and should be available during the entire treatment (Covington & Burns, 2006; Domar, 2015; Furman et al., 2010; Stevenson, Hershberger, & Bergh, 2016).

Several lifestyle factors might underlie infertility issues. Body mass problems, smoking and drinking excessive amounts of alcohol decrease fertility (Du Plessis, Cabler, McAlister, Sabanegh, & Agarwal, 2010; Kort et al., 2006; Waylen, Metwally, & Jones, 2009). Furthermore, an unhealthy diet, lack of physical activity and environmental harmful factors are associated with the unfavourable functioning of the reproductive organs. The outlined empirical findings suggest that infertility treatments can be augmented with lifestyle programmes that can enhance fertility effectively and in which patients can participate during medical treatment (Wise, Cramer, & Hornstein, 2011).

Thus, it is important to develop complex programmes that respect the integrity of the body and the soul, that consider infertility problems to be a relationship issue and that suit the requirements of the patients perfectly (Brucker & McKenry, 2004; Domar, 2015; Randi et al., 2016; Stevenson et al., 2016; Szatmári, Fejes, & Király, 2018; Van den Broeck et al., 2010).

Material and methods

During the first phase of the study, between 2017 and 2018, we collected information about the psychosocial characteristics of Hungarian males suffering from infertility or decreased reproductive capacity by employing general psychological questionnaires. The test battery was completed in three locations by conducting face-to-face interviews: An infertility centre, an andrology clinic and an andrology out-patient unit. Criteria to participate in the study included male factor infertility and participation in infertility treatment in the same clinic.

The aim of this study was to assess the efficacy of the method of paramedical counselling provided by professional helpers such as nurses, mental hygienists, doctors during the treatment period for male factor infertility by employing the used patient conducting model developed during the last decade (Helembai, 2019). Furthermore, the impact of the counselling on the development of infertile males' adaptive health

behaviours that influence reproduction by broadening the knowledge of the patients during the treatment process and promoting positive change based on satisfaction rates was assessed.

Study population

The participants included 108 individuals who were suffering from infertility or decreased reproductive capacity. Their ages ranged between 26 and 49 years (average = 35.18, standard deviation = 4.92). The involved patients were from the Department of Obstetrics and Gynaecology, the Department of Urology and the Infertility Centre of Kaáli Institute. Ethics approval was obtained from the medical directors of the infertility and andrology clinics. All the participants volunteered, they received written information about the study and they signed a declaration of consent prior to completing the questionnaires (Human Investigation Review Board, Albert Szent-Györgyi Clinical Centre 82/2017-SZTE).

I divided the patients into two groups: The observed group that received infertility paramedical counselling (n = 57) and the control group (n = 51). The inclusion criterion for both groups was male factor infertility or decreased reproductive capacity. During the evaluation, we assessed vulnerability in both groups. The results of psychological questionnaires, the level of depression, anxiety and perceived stress, indirectly refer to vulnerability.

According to clinical diagnoses, there were three subgroups: (1) azoospermia (n = 24); (2) OAT syndrome (oligoasthenoteratozoospermia) (n = 51), oligoasthenozoospermia (n = 4) and oligozoospermia (n = 19); and (3) unexplained infertility (of unknown origin) (n = 10).

Relevant demographic data of the control (n = 51) and observed (n = 57) groups that were related to the study hypothesis were compared; frequencies and averages are presented in Table 1. There was no difference in the demographic characteristics of the two groups despite the significant difference between the two groups in relation to the time elapsed from the diagnosis of infertility; the observed group was diagnosed earlier (t = 3,1; DF = 82,457; p = 0,003; mean difference = 11.33; CI- = 3.82; CI+ = 18.84; Cohen's d = 0.59). There was also a significant difference in the period of family planning. On average, patients in the observed group had been trying to start a family for longer (t = 2.48; DF = 90.89; p = 0.02; mean difference = 9.73; CI- = 1.74; CI+ = 17.72; Cohen's d = 0.47).

Materials

The questionnaires were employed to assess the distress accompanying infertility as well as the coping and communication strategies the patients suffering from infertility used. In accordance with the literature, we used general test batteries to assess distress, which measured the occurrence of depressive symptoms and level of anxiety. These questionnaires had all been widely employed in studies examining groups of patients suffering from other diseases, healthy populations and infertile patients. The short version of the Beck Depression Inventory (Beck & Beck, 1972; Rozsa, Szadoczky, & Füredi, 2001) was used to measure depression. The State-Trait Anxiety Inventory (STAI) originally developed by Spielberger (1970) was employed to measure trait anxiety. Other measures employed included the Rosenberg Self-Esteem Scale (Sallay, Martos, Földvári, Szabó, & Ittzés, 2014) to measure self-esteem; Caldwell's

Table 1. Demographic characteristics (n = 108).

	Group			
	Observed group		Control group	
	n	%	n	%
Education				
Vocational school	10	17.54%	6	11.76%
High school	18	31.58%	19	37.25%
College or university degree	29	50.88%	26	50.98%
Marital state				
Married and living together	37	64.91%	36	70.59%
Married and living separately	4	7.02%	4	7.84%
Civil partnership	15	26.32%	11	21.57%
Living alone	1	1.75%	0	0%
Activity				
Active financially. public servant	17	29.82%	17	33.33%
Active financially. employed	28	49.12%	24	47.06%
Active financially. entrepreneur	11	19.3%	9	17.65%
Active financially. works temporarily	1	1.75%	1	1.96%
Type of work				
Manual labour	13	22.81%	10	19.61%
White-collar job	15	26.32%	13	25.49%
Manual and intellectual work	17	29.82%	15	29.41%
Sitting job	12	21.05%	12	23.52%
Type of residence				
Capital city	0	0%	1	1.96%
City	22	38.6%	29	56.86%
Shire-town	20	35.09%	10	19.61%
Village	15	26.32%	10	19.61%
Ranch	0	0%	1	1.96%
Diagnosis				
Azoospermia	38	66.7%	37	72.5%
Oligozoospermia	13	22.8%	10	19.6%
Idiopathic	6	10.5%	4	7.8%
	Mean	Standard deviation	Mean	Standard deviation
Age (years)	35.47	±5.56	34.84	±4.1
Marital state (months)	7.63	±4.19	7.14	±4.74
Date of diagnosis of infertility (months)	26.14	±24.63	14.8	±11.83
Family planning (months)	36.12	±25.31	26.39	±14.49

Social Support Questionnaire (Caldwell, Pearson, & Chin, 1987) to assess social support; the Perceived Stress Scale (Stauder & Konkoly-Thege, 2006) to measure perceived stress; the satisfaction with life subscale of the Rahe Stress and Coping Inventory (Rozsa et al., 2005) to identify coping strategies and the Conflict Resolution Questionnaire (Rozsa et al., 2008). The participants also answered short questions on health behaviours including smoking, alcohol intake, healthy diet, physical activity and environmental harmful factors.

Questionnaires to assess psychological vulnerability were completed in the first phase of treatment after being diagnosed with (1) or with a previously known and treated infertility (2), but prior to any operation, insemination or ART.

In the observed group, the validated questionnaires were completed at the start of medical interventions, in the first phase of counselling and after counselling at the end of the four months period. The control group only completed the validated questionnaires at the beginning and end of the medical treatment, they did not receive infertility counselling. After a thorough examination of the patients and after their reactions to, and awareness of the disease were assessed, the observed group during a four-month

period received counselling and support altogether five times at three weeks intervals. Patients suffering from infertility or decreased fertility were involved in both groups (observed and control). They were provided counselling after randomisation.

Sixty patients entered the observed group, 3 dropped-out after the start of the programme, because they also ceased reproductive therapy due to poor prognosis (due to age) or financial reasons. Two persons refused counselling due to lack of time.

Fifty-eight patients entered the control group, 7 dropped-out because of the pre-term cessation of reproductive therapy due to personal reasons like unpredictable treatment planning, long waiting list and poor prognosis (several unsuccessful previous treatments).

The final sample consisted of altogether 108 male patients receiving assisted reproductive treatment, randomised to observed group (n = 57) and control group (n = 51).

Infertility counselling there are three pillars: (1) emotional support, (2) providing information about the treatment (3) and evaluation which entails screening psychological vulnerability.

On the first occasion, an interview to evaluate their emotional condition, anxiety, self-esteem, stress, depression, satisfaction with life, social support and coping strategies was conducted. The patients' expectations of the treatment were also assessed.

During the following intervention, the second pillar of the counselling, information about the treatment was provided; specifically, about the results of examinations and treatment alternatives. We encouraged the expression of emotions in relation to a potential operation, the identification of personal causes of distress, the mobilising and development of coping strategies and skills and the exploration of the personal meaning of the infertility problem. In addition, emotional support was provided. After the psychoeducational compound of the consultation, we discussed healthy behaviours, lifestyle and stress issues. Counselling also functions as psychoeducation as it deals with the life event of being infertile and the psychological difficulties of the examinations. Special support may also be needed in decision situations and to understand findings.

We adjusted the timing of the consultation to the exact state of the patients. In many instances, counselling is the time to address the losses that the patients have experienced during unsuccessful treatments. During the first phase, we provided them with the opportunity to ventilate freely about their infertility problem. Accordingly, professionals should be provided with the opportunity to learn different skills such as communication strategies.

The psychoeducational part increased and deepened the patients' knowledge about decision-making. The importance of the positive aspects of extreme hardship was emphasised. Furthermore, monitoring and reflecting resources such as the cohesion of relationships and family support and increasing the patients' activities and competence were stressed.

The applied method relies on cognitive behavioural therapy combining it with facilitative and supportive techniques, which support the mobilisation and concentration of inner resources, the acceptance of new knowledge and the development of new skills and habits. They also promote the elaboration of emotions and decision-making.

Facilitative techniques are e. g. paraphrasing, reflecting, summing up and clarifying emotions, confronting, questioning, providing information. Supportive techniques are e. g. the method of stopping thoughts, strategies supporting interpersonal efficacy, practicing assertiveness. Other techniques are strategies to change behaviour, gradual

recognition and alteration of emotions and behaviour, habituation of situations. The interventions were standardised based on pre-set programmes (Table 4). Consultations were conducted following the pre-set topics. Also in Tables 3 and 4 (Table 3 The components of infertility counselling, Table 4 Standardised programs of providing information and psychoeducation). The above-described program can be inserted into the applied medical treatment protocols.

The aims of the consultation were adapted to the mental state of each patient. This meant that we emphasised the 'topic' in which the actual patient showed the key problem, e. g. among those patients who showed more severe symptoms of anxiety, or elevated levels of stress, or decreased social support we emphasised these fields during counselling in order to facilitate them to use more adaptive coping mechanisms required in their specific situation.

We hypothesised that counselling as a method of the patient conducting process due to supporting the coping strategies of the observed group will become more problem-focused and there will be an improvement in the indicators of well-being.

Statistics

Data processing and evaluation were conducted by employing SPSS version 23. We performed descriptive statistics, a chi-squared test, Fisher's exact test, two sample t-test, Welch's t-test, repeated measures multivariate analysis of covariance and Spearman's rank correlation to evaluate the demographic characteristics and data of the clinical scales.

In the repeated measures multivariate analysis of covariance, the observed group was the interpersonal independent grouping variable, the two times of the measurement were personal grouping variables and time elapsed from the diagnosis and with family planning were covariates. Thus, the differences and bias in these variables between the two groups were controlled. The scales of the WCQ and the results of the STAI, BDI, RSES and Holmes-Rahe tests were the dependent variables. Statistical significance was defined as $p < 0.05$. In accordance with the consensus, 95% confidence intervals are shown in the figures.

Results

To test the hypothesis of the study, we first examined the clinical characteristics of the control and observed groups at the start so as to reduce bias due to potential differences (Table 2). According to statistics in WCQ's problem analysis ($t = 0.47$; $DF = 106$; $p = 0.64$; mean difference = −0.06; CI- = −0.33; CI+ = 0.2; Cohen's $d = 0.09$), emotionally motivated action ($t = 0.25$; $DF = 106$; $p = 0.81$; mean difference = −0.02; CI- = −0.2; CI+ = 0.15; Cohen's $d = 0.05$), purposeful action ($t = 0.18$; $DF = 106$; $p = 0.86$; mean difference = 0.018; CI- = −0.19; CI+ = 0.23; Cohen's $d = 0.03$), adaptation ($t = -1.36$; $DF = 106$; $p = 0.18$; mean difference = −0.17; CI- = −0.43; CI+ = 0.08; Cohen's $d = 0.26$), asking for help ($t = -0.64$; $DF = 106$; $p = 0.52$; mean difference = −0.09; CI- = −0.36; CI+ = 0.19; Cohen's $d = 0.12$), seeking emotional balance ($t = -0.89$; $DF = 106$; $p = 0.38$; mean difference = 0.21; CI- = −0.26; CI+ = 0.68; Cohen's $d = 0.18$), scales in the STAI result ($t = -0.05$; $DF = 106$; $p = 0.96$; mean difference = −0.03; CI- = −1.44; CI+ = 1.37; Cohen's $d = 0.01$), in the BDI result ($t = -0.07$; $DF = 106$; 0.94; mean difference = −0.06; CI- = −1.57; CI+ = 1.46; Cohen's $d = 0.01$), in the RSES result ($t = 0.14$; $DF = 106$; $p = 0,89$; mean difference = 0.01; CI- = −0.16; CI+ = 0.18; Cohen's

Table 2. Psychodiagnostic tests.

		WCQ Problem analysis at start	WCQ Problem analysis at end	WCQ Emotionally motivated action at start	WCQ Emotionally motivated action at end	WCQ Purposeful action at start	WCQ Purposeful action at end	WCQ Adaptation at start	WCQ Adaptation at end	WCQ Asking for help at start	WCQ Asking for help at end	WCQ Emotional balance at start
Observed group	Mean	1.92	02.02	0.6	0.52	1.3	1.63	1.27	1.22	1.18	1.32	1.29
	St. dev.	±0.62	±0.56	±0.48	±0.4	±0.58	±0.61	±0.68	±0.64	±0.76	±0.66	±1.59
Control group	Mean	1.98	1.97	0.62	0.51	1.28	01.02	1.45	1.43	1.26	1.39	01.08
	St. dev.	±0.76	±0.68	±0.43	±0.36	±0.5	±0.42	±0.64	±0.64	±0.67	±0.73	±0.61
All	Mean	1.95	1.99	0.61	0.52	1.29	1.34	1.35	1.32	1.22	1.36	1.19
	St. dev.	±0.69	±0.62	±0.45	±0.38	±0.54	±0.61	±0.67	±0.65	±0.72	±0.69	±1.23
		WCQ Emotional balance at end		WCQ Withdrawal at start	WCQ Withdrawal at end	STAI at start	STAI at end	BDI at start	BDI at end	RSES at start	RSES at end	Holmes-Rahe at start	Holmes-Rahe at end
Observed group	Mean	1.18		1.32	1.41	47.95	47.19	3.47	2.28	3.39	3.47	11.25	11.3
	St. dev.	±0.8		±0.83	±0.84	±3.78	±3.41	±4.17	±3.18	±0.49	±0.45	±2.49	±2.82
Control group	Mean	1.45		1.7	1.69	47.98	47.84	3.53	2.9	3.38	3.41	11.22	10.67
	St. dev.	±0.72		±0.9	±0.9	±3.54	±3.25	±3.72	±3.12	±0.4	±0.39	±2.68	±3.1
All	Mean	1.31		1.5	1.54	47.96	47.5	3.5	2.57	3.39	3.44	11.23	11
	St. dev.	±0.77		±0.88	±0.88	±3.65	±3.33	±3.94	±3.15	±0.45	±0.43	±2.57	±2.95

Table 3. The components of infertility counselling.

Exploration	Assessment of anxiety, self-esteem, depression, satisfaction with life, stress reactivity, social support and the applied coping strategies
Support	Emotional support, providing space for ventilation; Exploration of the personal understanding of the infertility problem; Mobilisation of coping strategies; facilitation of coping with distress; Increasing self-competence and activity (involving the client in decision making); Elaborating guilt and shame; Emphasising the positive aspects of the difficult life situation, Assessment and support of the cohesion between the couple and the family.
Counselling	Psychoeducation; discussion of health behaviour, life-style and stress. Providing information on the course of examinations, possible surgical interventions and therapeutic alternatives. Answering questions. Interpreting results. Providing help in decision making.

Table 4. Standardised programs of providing information and psychoeducation.

Session 1	*Program (1)*; Describing the course of required examinations for infertility. The knowledge regarding examinations: what, when and how. *Program (2)*; Assessment and review of the importance and the results of examinations. *Program (3)*; Describing the diagnosed disease (decreased fertility/infertility) and assessment of the client's knowledge of the disorder. *Program (4)*; Clarification and emphasising the role of the partner.
Session 2	*Program (5)*; Assessment of the key risk factors; (smoking, alcohol intake, stress, environmental risk factors) *Program (5.1)*; Reviewing the significance of lifestyle. Pathologically elevated chronic stress, smoking, alcohol intake, environmental risk factors. Life-style counselling.
Session 3	*Program (6)*; Evaluation, interpretation and review of the results of examinations. *Program (7)*; Assessment of knowledge of and compliance with medicines. *Program (7.1)*; Discussion of the significance and mechanisms of action of medicines and therapy settings (hormonal therapy). *Program (7.2)*; Describing the appropriate way of taking medicines. Program (8); Providing information to improve health (diet, lifestyle, physiology). Answering questions.
Session 4	*Program (9)*; Describing surgical interventions to increase fertility/treat infertility. Answering questions (Micro-TESE, TESA, MESA, DESA) *Program (9.1)*; Providing further information on assisted reproductive treatment (e. g. IUI, IVF, ICSI).
Session 5	Program (10); Summary. Program (10.1); How the knowledge of the patient changed. Discussion of the use of counselling in the patient's experience at the end of the programs. Program (10.2); The summary of the therapist at the end of the program.

d = 0.03) and in the results of Holmes-Rahe test (t = 0.06; DF = 106; p = 0.95; mean difference = 0.03; CI- = −0.96; CI+ = 1.02; Cohen's d = 0.01), there was no difference at the start. The withdrawal scale of the WCQ showed a difference at the start (t = −2.26; DF = 106; p = 0.03; mean difference = −0.37; CI- = −0.71; CI+ = −0.05; Cohen's d = 0.44).

According to the evaluation, the time elapsed during the examination (F = 3.2; DF = 12–93; p = 0.001; partial eta squared = 0,29) had a significant main effect. Furthermore, the interaction between the elapsed time and the intervention was also significant (F = 7.53; DF = 12–93; p < 0.001; partial eta squared = 0,49).

When comparing the data of the tests at the two occasions of measurement, a significant change in the BDI results (F = 10.44; DF = 1–104; p = 0.002; partial eta squared = 0,09; Figure 1), in the STAI results (F = 8.82; DF = 1–104; p = 0.004; partial eta squared = 0,08; Figure 2), in the emotionally motivated action scale of WCQ (F = 7.89; DF = 1–104; p = 0.006; partial eta squared = 0,07; Figure 3) was evident; all three decreased. The interaction capturing the effect of the intervention was significant in the withdrawal (F = 3.96; DF = 1–104; p = 0.049; partial eta squared = 0,04; Figure 4), purposeful action (F = 58.75; DF = 1–104; p < 0.001; partial eta squared = 0,36; Figure 5) and seeking emotional balance (F = 4.68; DF = 1–104; p = 0.033;

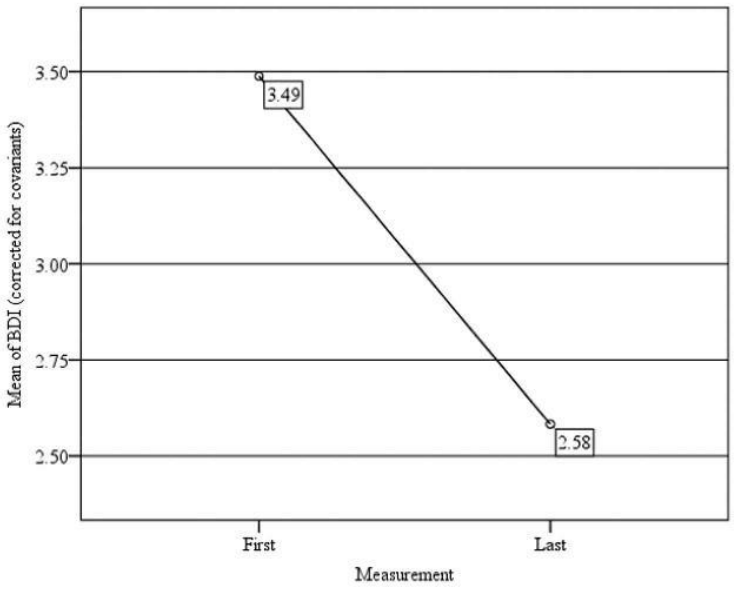

Figure 1. BDI results

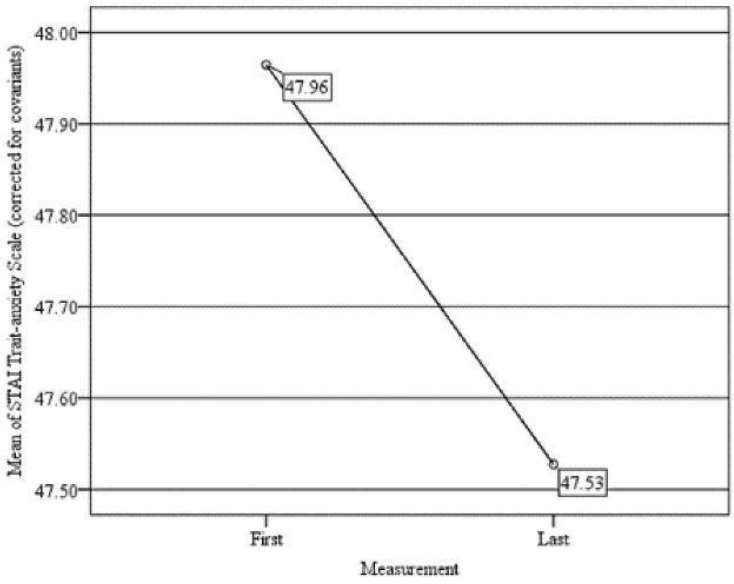

Figure 2. STAI results

partial eta squared = 0,043; Figure 6) scales of WCQ and in STAI results (F = 4.33; DF = 1–104; p = 0.04; partial eta squared = 0,04; Figure 7) (Table 2). The withdrawal and purposeful action results of WCQ increased in the observed group while they decreased in the control group.

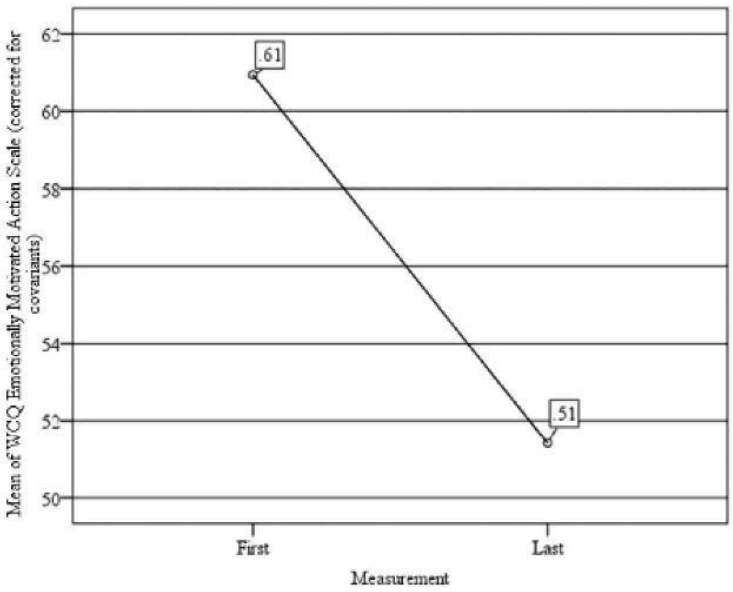

Figure 3. The emotionally motivated action scale of WCQ

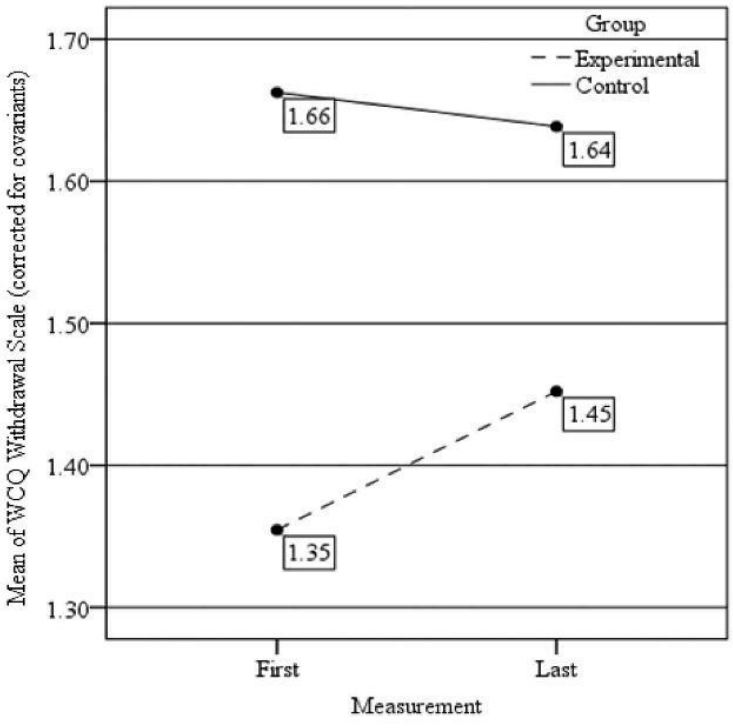

Figure 4. The withdrawal scale of WCQ

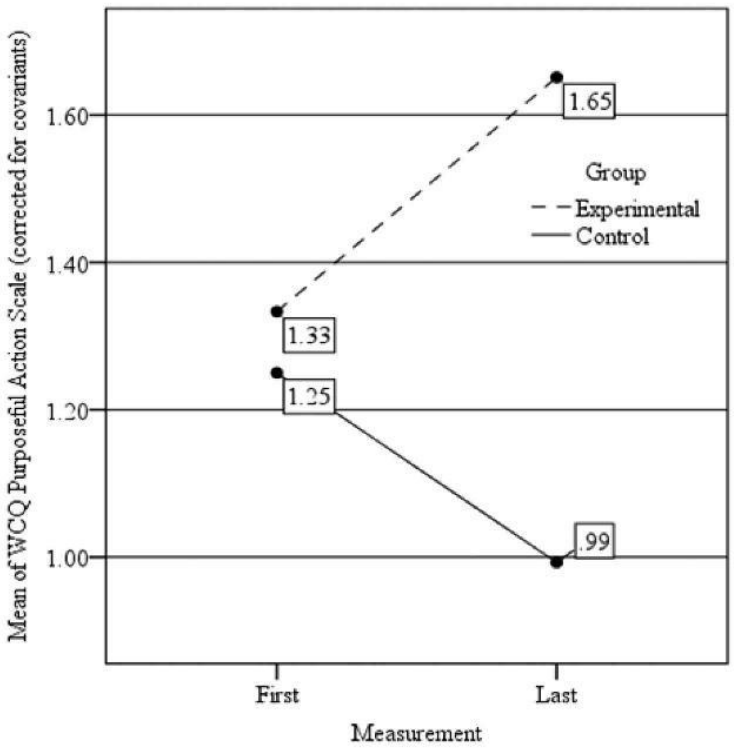

Figure 5. The purposeful action scale of WCQ

Seeking emotional balance and trait anxiety of the STAI results decreased in the observed group and trait anxiety of the STAI results did not change with time in the control group.

Discussion

Our study highlighted how the group that received interventions had an intense awareness of the diagnosis and the aims and nature of the indicated treatment. This group used purposeful problem-solving coping strategies during the infertility treatment. As a result of the interventions during the fourth and fifth meeting the persons in the observed group used adaptive coping strategies, e. g. problem analysis and purposeful action more frequently. While infertility treatments can be exhaustive, the person's sense of security was increased by the transparency of examinations, by the predictability of the treatment and by the thorough knowledge of the clinic and its staff. According to the cognitive model long-term adaptation is facilitated by problem analysis, since the person makes efforts in stressful situations with low control. Those persons who re-evaluate childlessness experience a significant decrease in stress levels when coping with infertility (Gameiro & Boivin, 2015; Terry & Hynes, 1998; Van den Broeck et al., 2010). The patients reported they were satisfied with the intervention. Their levels of depression and anxiety

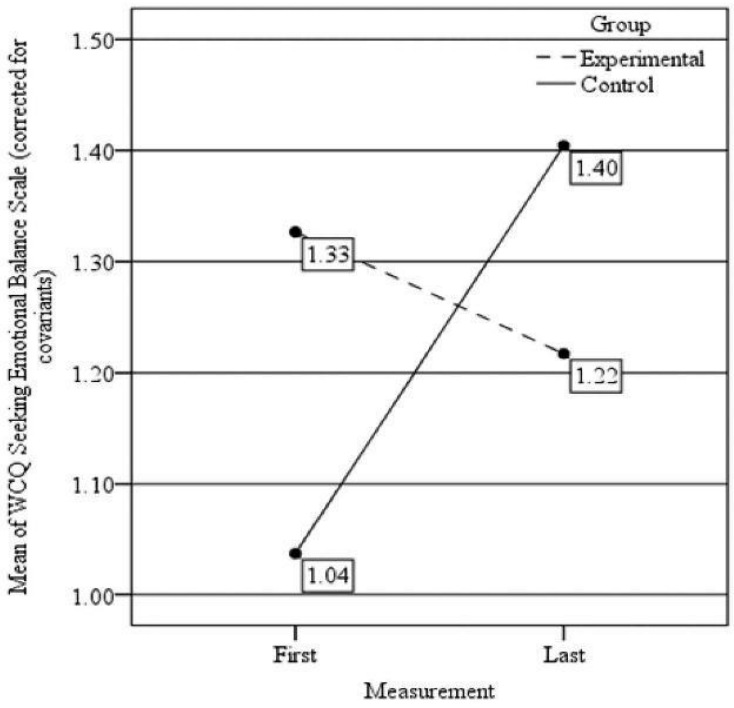

Figure 6. The seeking emotional balance scale of WCQ

decreased from those observed at the start of the interventions and differed from the control group's results.

Male infertility affects an increasing number of males in the reproductive stage of their lives. This challenges professionals working with reproductive technologies and paramedical helpers. Males' coping strategies may differ from those of females. Their attitude towards diseases and frequency of seeking medical assistance also differs in comparison to females (Nikoloudakis et al., 2018). Previous studies have revealed that infertility as a mental problem affects both members of the couple. Although several studies have examined the anxiety and coping associated with female infertility, studies of male infertility are uncommon and usually only assess their knowledge (Cserepes & Bugan, 2015; Lakatos, Szigeti, Ujma, Sexty, & Balog, 2017).

Infertility clinics should provide their clients with more apparent and traceable treatment in order to enable them to apply more coping strategies during difficult times and to support both partners. Studies were conducted in 2010 to explore how males appreciate a supportive group during assisted reproductive treatment. The participants showed a positive reaction towards the counselling and believed they could talk about their problem in an accepting environment. It is noteworthy that those males who sought counselling suffered primarily from male factor infertility. This guided us in choosing the target group. We were curious about the patients' conditions after diagnosis and how supportive therapy could help them. Decreasing depression and anxiety is not only

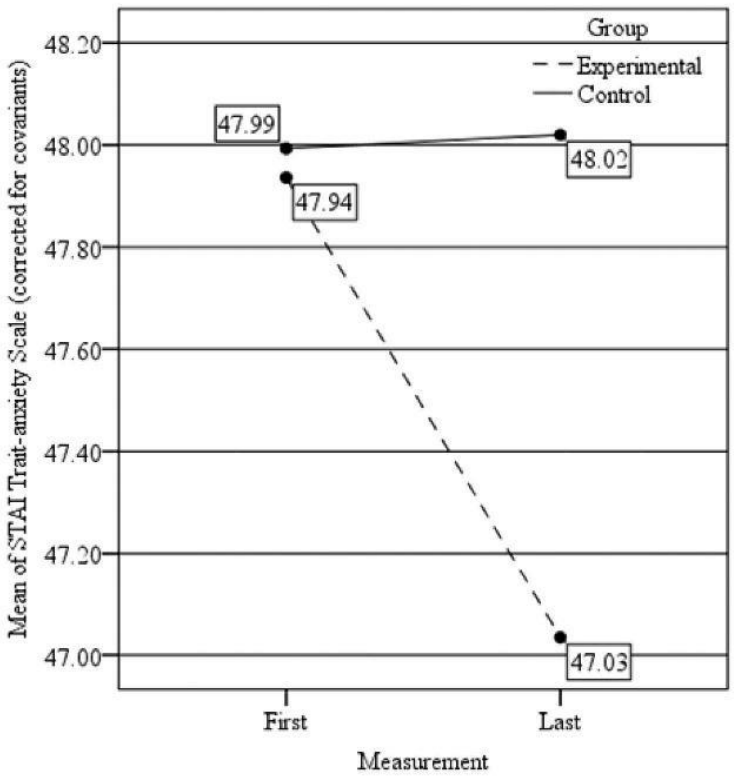

Figure 7. STAI Trait-anyiety scale

important for their relationship, but clinical findings also verified that there is an inverse relationship between psychological stress and the parameters of the sperms even though its effect is mainly measurable in the group of patients with decreased fertility (Nargund, 2015; Wdowiak, Bien, Iwanowicz-Palus, Makara-Studzinska, & Bojar, 2017) and it can also lead to leaving the treatment. Therefore, a non-pharmaceutical decrease in anxiety and stress and providing information and coping strategies may be crucial.

Because this study was limited by the number of participants, we did not evaluate the characteristics of coping strategies in the different subgroups so as to apply personalised therapies according to their diagnosis. Consequently, this remains a goal for further studies.

In summary, with the paramedical counselling of clients with infertility problems a more favourable mental well-being can be established with the active participation of professional helpers. Patients may receive effective, targeted and problem-specific help. The main task of patient-focused counselling is to assure that patients understand the consequences of their choice of treatment, provide sufficient emotional support and cope with the consequences of experiencing infertility in a healthy way.

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No potential conflict of interest was reported by the authors.

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